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HISTORICAL ACCOUNT

OF THE

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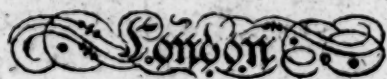
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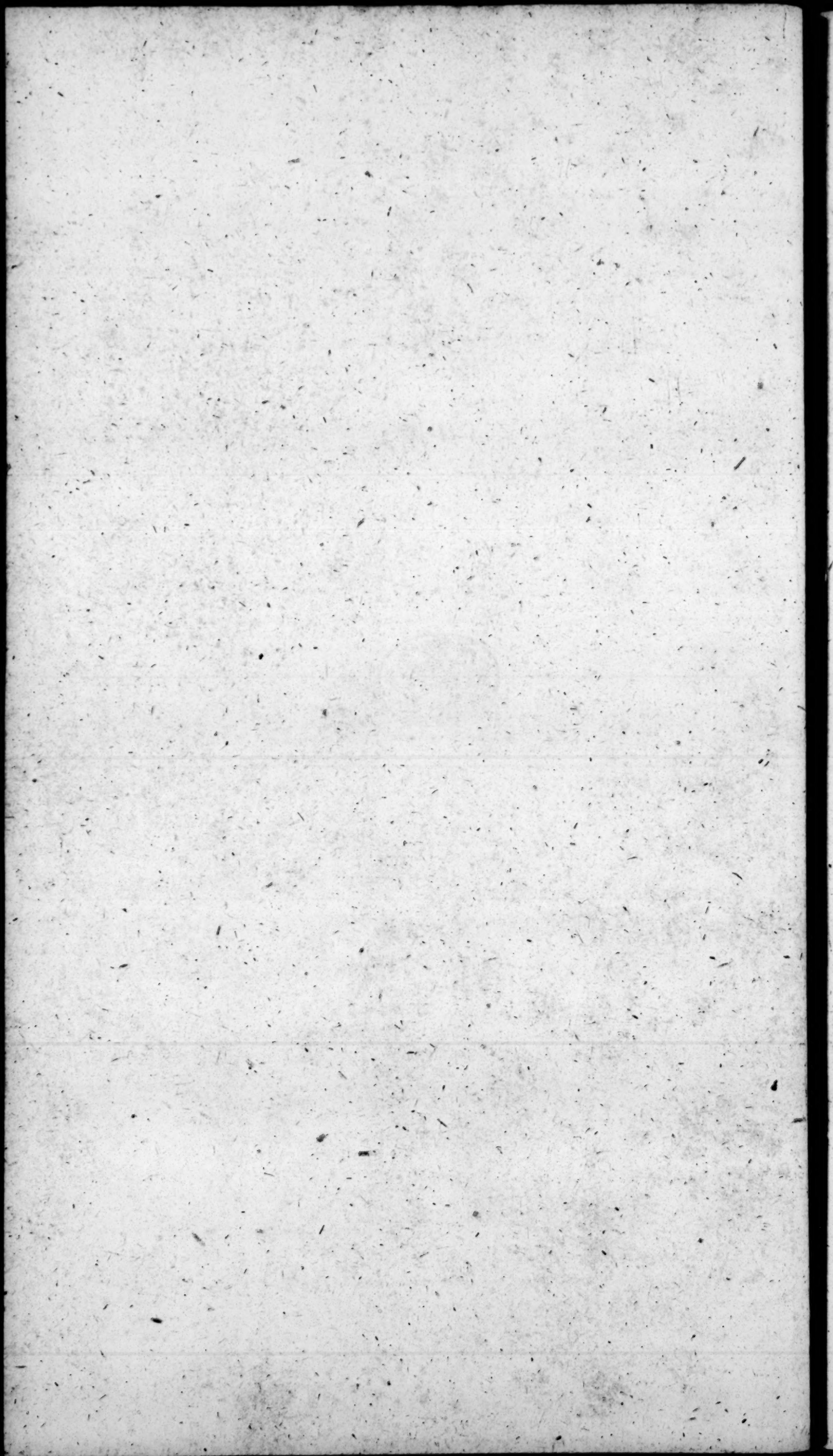
TO THE

INVENTION OF PAPER.

PRINTED ON THE FIRST USEFUL PAPER MANUFACTURED SOLEY
FROM STRAW.



PRINTED BY T. BURTON, NO. 31, LITTLE QUEEN-STREET.
1800.



TO

HIS MOST EXCELLENT MAJESTY

GEORGE THE THIRD,

KING OF GREAT BRITAIN, FRANCE,

IRELAND, &c. &c. &c. &c.

MOST GRACIOUS SOVEREIGN,

SIRE,

YOUR MAJESTY having been MOST GRACIOUSLY pleased to grant me Patents for extracting Printing and Writing Ink from Waste-Paper, by reducing it to a Pulp, and converting it into White Paper, fit for writing, printing, and for other purposes; and also for manufacturing Paper from Straw, Hay, Thistles, waste and refuse of Hemp and Flax, and different Kinds of Wood and Bark, fit for printing, and other useful purposes,

I therefore most submissively entreat permission to lay at YOUR MAJESTY'S feet the first useful Paper which has ever been made from Straw, without any rags or addition, and on which these lines are printed; but at the same time most humbly beg leave to observe to YOUR MAJESTY, that this Paper is not yet in such a state of perfection as it will hereafter be, when the necessary implements are completed, and the Manufactory regularly established and farther advanced; but as there now can be no doubt that good and useful Paper may be manufactured solely from Straw, I

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thought

thought it my duty (imperfect as it is) to present to my MOST GRACIOUS SOVEREIGN, who is ever ready to receive favourably the most humble endeavours which tend to the common welfare, and who, at the same time, is the benevolent Father of his Subjects, and has ever proved himself the Patron and Protector of the Arts and Sciences, the first Paper made of Straw.

Might I but be persuaded that YOUR MAJESTY would deign to look favourably on these my humble attempts of discovery, it would be a constant incitement to future inquiry, and the prospect of meriting YOUR MAJESTY'S commendation will be the greatest pleasure my heart can be sensible of.

With my most ardent wishes for YOUR MAJESTY'S health and longevity, and with all possible deference and humility, I beg leave, MOST GRACIOUS SOVEREIGN, to subscribe myself,

YOUR MAJESTY'S

most devoted,

most obedient,

and most humble servant,

September, 1800.

Matthias Koop



THE art of Paper-making ought to be regarded as one of the most useful which has ever been invented in any age or country ; for it is manifest, that every other discovery must have continued useless to society, if it could not have been disseminated by manuscripts, or by printing.

Scientific men, who were neither artists nor manufacturers, have, by means of this invention, been enabled to communicate their projects, which mechanics have afterwards improved and perfected, and by this means enriched the commonwealth.

Without the use of Paper, geography and navigation must have been very incorrectly understood ; the beautiful charts of the ocean so accurately laid down have established our commercial intercourse with every part of the globe with safety ; at the same time that the delineations upon maps of places, rivers, and countries, are now so correct, that they enable a traveller to proceed without danger, and even predict, with certainty, the time it will require to convey him to any part of the globe.

It may be asserted, indeed, of this country, that its grandeur and commercial dignity have been greatly exalted by the invention of Paper; for it is presumed, that the superiority which distinguishes the manufactures of this Island, chiefly depends upon the liberal publications concentrated from all the rest of the world, which have so greatly increased in latter years, and which are likely farther to be augmented. It is, in short, the reputation of the goods fabricated in Great Britain, which has elevated it to the splendour and fame it now possesses, in the scale of nations, and enables it to monopolize the trade of the universe.—All these are benefits which have flowed from the invention of Paper, and which have so largely contributed to the present flourishing state of the country.

What infinite trouble and labour, what a fruitless consumption of time has not been saved by the knowledge of Paper! how many laborious and dangerous experiments have not philosophical projectors been spared! what labour of investigation and study have not been abridged by the events which the experiments of others have handed down to posterity! thereby affording to the present age a body of information more than adequate to the knowledge any one man could have attained to in a thousand years, with all his faculties.

This reflection alone must fix such an impression on any thinking mind of the invaluable utility of Paper, as to render any farther commendation unnecessary; but, in short, the invention

invention of Paper has been the sole cause of the various gradations of improvement in every art and science. Without it the present age would neither have been more civilized nor wiser than it was many centuries ago, because one age could never have conveyed to its posterity what the labours of the past had atchieved; for it is well known that, in dark and barbarous ages, the inhabitants of no country have ever made any progress towards improvement and civilization without the use of Writing, Printing, and Paper; and it seems very probable, that the early knowledge of this article amongst the Chinese has been the cause of those acquirements which have distinguished that truly wonderful nation: for it may be affirmed, that in proportion to the quantity of Paper consumed, by any stated number of inhabitants in literary pursuits, so will be their comparative information, civilized state, and improvement.

To enumerate all the various advantages which the invention of Paper has afforded mankind, could not be contained in an Essay of this nature: its uses are unquestionable; and the important services it has yielded to all countries where it has been employed are not to be calculated; it is sufficient to say here, that the growing youth are educated with facility in the principles of their duty, and barbarous states have been softened and enlightened by means of this discovery.

Although this subject might be much enlarged upon, the intention of this Address is most humbly to present to

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Your

Your Most Gracious Majesty the *first* useful Paper manufactured *solely* from *Straw*, and on which these lines are printed.

From the remarks which have been already made, every person must be convinced, that it is of the utmost consequence to prevent the scarcity of the materials from which Paper is to be fabricated. Although cotton has been likewise used for this purpose, paper-makers in this country have depended on linen Rags for the regular pursuit of their employment.

All Europe has of late years experienced an extraordinary scarcity of this article, but no country has been so much injured by it as England. The greatly advanced price, and the absolute scarcity, equally operating to obstruct many printing-presses in this kingdom; and various works remain, for these reasons, unpublished, which might have proved very serviceable to the community.

The great demands for Paper in this country have rendered it necessary to be supplied from the continent. This supply is extremely precarious, and is likely to be more wanted, as the consumption of Paper increases, because the material, which is the basis of Paper, is not to be obtained in England in sufficient quantity. The evil consequence of not having a due supply of Rags has been the stoppage of a number of Paper-mills; for it is a manufactory which requires numerous hands (of men, women, and children);

a great number of whom, have been thrown upon their respective parishes for want of employment. A still more important consideration, in the view of commerce, presents itself, when the raw material comes from abroad, because the importation of it is paid in hard cash, the preparation of which might have employed numbers of idle hands at home advantageously.

These reflections induced me to make various experiments, with a view to remedy, in some degree, this evil; and, after many trials, I have the satisfaction to remark, that I have discovered a substitute for linen Rags, which has been heretofore unknown, and which will merit the attention of the public. This discovery is the Art of extracting Printing and Writing Ink from Waste-Paper, whether in small or large Pieces, obliterating the ink, and rendering the Paper perfectly white, *without injuring the texture* of the regenerated Paper, and of a quality as good as it originally was, for the purposes of writing and re-printing.

It is worthy of the directors of families to order their servants to save all the waste White Paper, such as letters and old writing-paper, which are generally thrown away or burnt, and regarded as of no consequence; for, should this be attended to, very considerable quantities would be collected, and large sums of money saved, which are now expended in foreign countries for Rags; because, if we calculate that Great Britain contains fifteen hundred thousand

land families, and that half a sheet of Paper should be daily saved in every family, it would produce four thousand four hundred tons,* which is about one-third of the quantity of Rags which have, of late, been converted annually into Paper in this country; whereby near two hundred thousand pounds would annually remain in this country, which sum is now sent abroad for the purchase of Rags; and eighty-two thousand one hundred and twenty-five pounds would be saved from fire and destruction, calculating a pound of old Paper torn into pieces at two-pence.

I HERE beg leave to observe, that, although the wisdom of the law has given, for a certain number of years, an exclusive right to Patentees, as an encouragement to promote the skill and industry of individuals, and to encourage new and useful discoveries, all Patents labour yet under one great evil, which seems to have been overlooked by the legislature; which is, that the publicity of all exemplifications give foreign countries an opportunity of availing themselves, by examining the Patent-Office, and obtaining a knowledge of the discovery, in the particular branch to

* A ream, or five hundred sheets, being calculated at eighteen pounds weight.

which it relates, of those advantages which are secured in this country to the Patentee alone. They are thereby enabled to take immediate advantage of the information, and establish the manufactory abroad, to the irreparable detriment of British commerce, as well as the Patentee, who, perhaps, suffers an immense loss in one day, on an invention which he had indefatigably laboured at for many years, and at great expense, to bring to perfection: for, ever since the year 1794, books have been published with an exemplification of all Patents granted by *Your Majesty*, with the drawings and complete description of all new-invented and improved machines, which books are exported, and translated into several languages, by which means the merchant and manufacturer on the continent get the copy of every specification. It is therefore, a subject meriting much attention; to strike out some plans which would, in future, frustrate such attempts.

It has been imagined, that the present war has principally contributed to produce the scarcity of paper-stuff, which, however, does not appear to be the sole cause, because the quantity of rags used for making lint is very inconsiderable, compared to the enormous quantity at present used for the manufacture of Paper. Cartridges have usually been made on the continent of old written Paper, which heretofore has been of no other use to Paper-makers than for the fabrication of pasteboards.

boards.—It appears, from various considerations, that the scarcity has originated from the extension of learning, which occasions much larger quantities of Paper for writing and printing; the large increase of newspapers and monthly publications. Additional stationers, printers, and booksellers, countenance this opinion. More children are now every where taught to read and write; and the hand-bills of every description, used for shopkeepers, plays, quackery, and other trades, require additional quantities of Paper. Paper-hanging, which is an invention of the middle of the seventeenth century, has, of late years, become more general; and few new-built houses are finished with walls, or wainscot, as formerly, but the surface is every where decorated with painted or stained Paper, which is the most beautiful, the cleanest, and the cheapest ornament for furnishing rooms.

I beg leave to observe, that little general knowledge, upon this useful subject, has been hitherto communicated to the public; I, therefore, will endeavour to give a brief historical account of the various methods and materials which have been used to convey ideas to posterity, from the most ancient date to the period when the art of making paper, from linen rags, was invented.

The art of writing, in itself, proves that mankind, at the time of its invention, must already have been in a certain degree civilized, and cannot therefore be very ancient; but the exact time when this art was discovered is impossible to trace.

In

In the most ancient time, when writing was not yet discovered, very simple means were used to preserve the remembrance of important events. Tradition represented, therefore, during many centuries, what now is more completely effected by writing and printing. Trees were planted, heaps of stone, or unornamented altars and pillars, were erected, plays and festivals were ordered, and songs sung to keep up the recollection of past facts. The sacred history mentions, that the Patriarchs erected altars or heaps of stones as remembrances of past events.

Rough stones and stakes were the first reminding letters of the Phœnicians. In the environs of Cadiz, several heaps of stones have been found; monuments of Hercules's expedition against Spain. The ancient inhabitants of the North placed, in different situations, stones of an extraordinary large size, to remember great events. And we have found, in modern times, that the savages in America do the same; and some place bows on the tombs of men, and mortars with pestles on the tombs of women. It has been likewise a custom to give names to certain places, and their environs, which referred to the transactions and deeds which there took place.

Since the art of writing was invented, several materials have been used on which was engraved or written what was wished to be conveyed to posterity. But nothing positive can be ascertained with respect to the different materials employed by the ancients for that purpose, except that a distinction has been

been made between public records and private writings. For the first; stones, timber, and metals, were chiefly used; and, for the latter, leaves and bark of trees. The Egyptians, the inhabitants of the Northern countries, and several others, made use of stones, rocks, and pillars, for that purpose.

Job mentions rocks as the materials used in his time; and the Danes engraved likewise upon rocks the deeds of their ancestors.

Josephus has related, that the children of Seth had, before the deluge, erected two pillars, and thereupon engraved their inventions and astronomical discoveries, the one of which was of stone, and the other of brick-clay, because they had heard, from their grandfather, Adam, that the world would be destroyed once by fire, and once by water; and, to prevent their knowledge of the motion of planets, &c. being lost to posterity, they had engraved it on the before-mentioned pillars; the one of which could not be destroyed by water, nor the other by fire; and the same author states, that the same pillar of stone existed still, in his time, in the country of Siriad. But where that country was situated is very difficult to ascertain; some say in Syria. Marsham, Vofz, and others assert it to be *Seirath*, mentioned in the Scripture, (*Judges, chap. iii. verse 26*); the most likely supposition seems to be, according to Dodwell, Stillingfleet, and Fabricius, that it was situated in Egypt.

These pillars bring into recollection others more celebrated, erected by Bacchus, Hercules, Osiris, and Sesostris, to commemorate their exploits. But the most famous were the pillars of Mercury Trismegistus, on which his doctrines and rules were engraved with hieroglyphic characters. Porphyrus mentions some pillars in the Island of Crete, on which the sacrificial service of Cybeles, and the religious rites were engraved; and, at the time of Demosthenes, there was still a column of stone existing, on which the code of laws was engraved. Numerous other pillars could be mentioned, but it is sufficiently ascertained, that the most ancient nations were not acquainted with any other method of keeping in remembrance their code of laws, acts and contracts, the history of events, and important discoveries; and these public records have been the sources of knowledge for the major part of the ancient authors.

It was likewise a custom to write on bricks, and stone plates, principally to immortalize laws, institutions, and important events.

The Babylonians, according to Pliny, wrote their first astronomical observations on bricks, and the ostracism of the Athenians was inscribed on oyster-shells, and the fragments of broken pots.

The most ancient monuments of Chinese knowledge were engraved on hard and large stones. The ten commandments were written on marble plates. Joshua wrote the other laws

on plates of the same kind, and the names of the twelve Jewish tribes were carved on precious stones on the ephod of the high priest. The inscriptions on Mount Sinai, and the surrounding mountains, ought to be noticed here, if their antiquity could be ascertained. The hieroglyphics of the Egyptians are chiefly found on obelisks, stone pillars, &c. and the decrees of Lycurgus were carved in stone. A very ancient Grecian superscription on stone is existing on the west borders of Asia Minor, where the Mitylenians have built the city of Sigium, from the gathered stones of the city of Troy. This city was destroyed long ago by the Iliensians; the stone still lies in the village of Ieni-Hissary, called, by the Turks, Gaurkioi, before the porch of the Greek church, and is used for a seat. The inscription on this stone is now upwards of 2360 years old. William Sherard, Esq. British Consul, at Smyrna, took the first copy of it; and Samuel Lisle, preacher to the English residing at Smyrna, copied it carefully, and it was afterwards engraved and printed in London, on nine sheets, by his Majesty's chaplain, Edmund Chishull, with explanations, in the year 1721. Still more ancient inscriptions at Amyclae have been discovered, and published by Fourmont and Barthelemy. They are written in the same manner as those of Sigeum, resembling plough-furrows, but they go from the right to the left, and were preserved in the Royal Cabinet, at Paris. Numerous other ancient inscriptions on stone are found commemorated in Carsten Niebuhr's Travels in Arabia. The convention of Smyrna and Magnesia was engraved on marble 270 years before the birth of Christ, and the *Jus Publicum* of the Athenians was engraved on triangular stones,

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named

named Cyrbes. Numerous old inscriptions in the Etruscan, Greek, and Latin languages, on stone and marble, on plates, urns, vases, and sarcophagi, are still preserved in the first and seventh room of the gallery of the Grand Duke of Tuscany, at Florence; and in the first room of that gallery are several inscriptions on burnt clay, with which the Etruscans covered their deceased friends. They are divided into twelve classes, and, notwithstanding several of them have been proved to be counterfeit, by the colour of the marble, the most part are genuine, which satisfactorily proves the art of writing was known to the ancients.

But these materials were soon found to be difficult to write upon, and therefore others, more simple and more convenient, were sought for. Bricks and stones were changed for different kinds of metals, and lead became then the most ancient writing substance. Job mentions, in chapter xix. verse 24, engravings with an iron pen on lead; and Pausanias says, that Hesiod's *Opera et Dies* was written on leaden tables. Pliny states, that lead was used for writing, which was rolled up like a cylinder. Hertius wrote to Decius Brutus on leaden tables. In Italy were preserved two documents of Pope Leo III. and Luitbrand, King of the Longobards; and, according to Kircher's *Museum*, Table X. many more of such writings on lead are to be found. For example, Montfaucon notices a very ancient book of eight leaden leaves, the first and last was used as a cover, and that it contains numerous mysterious figures of the Basilidians, and words partly Greek, and partly of Etruscan letters. On the back were
rings

rings fastened, by means of a small leaden rod, to keep them together.

Bronze was afterwards more frequently used than lead, as is certified in the History of the Maccabees, by Dionysius of Halicarnassus, Cicero, Livy, Pliny, Suetonius, and Julius Obsequens. Phœnician letters were on the kettle of bronze, devoted by Cadmus to Minerva, who was adored at Lindus, on the Island of Rhodes. But, as the kettle is not only lost, and the copies of the inscription, with those of Cadmifian letters, on several tripod vessels, mentioned by Herodotus, and others, I shall confine myself to those which still exist, of which the most remarkable are the famous *Scriptum de Bacchanalibus*, in the Imperial Library; Trajan's *Tabula Alimentaria*; and the helmet, found at Cannæ, with Punic letters, described in the *Museo Etrusco* of Gori, and which is now in the third room of the gallery of the Grand Duke of Tuscany, at Florence. I cannot omit noticing the eight tables of bronze, found in the town of Gubbio, in a subterraneous cabinet, when, in the year 1444, parts of an amphitheatre were removed: on seven tables the inscriptions were in the Latin, and one in the Etruscan language. Since that time several bronze tables, with Etruscan writing, have been dug up in Tuscany. The seven Latin have been described and engraved on copperplates, by Merula, Gruter, and others, and one by Thomas Dempster.

The criminal, civil, and ceremonial laws of the Greeks have been engraved on bronze tables, and the speech of Claudius, engraved

engraved on bronze plates, are yet preserved at the town-hall of Lions, in France.

The celebrated statutes or laws on twelve tables, the major part of which the Romans copied from the Grecian code, were first written on tables of oak, but according to others on ten ivory tables, and hung up *pro rostris*. But, after they had been approved by the people, they were engraved in bronze. But these were melted through fire occasioned by lightning which struck the capitolium, and consumed likewise numerous other laws for the cities and country, which were there deposited; the loss thereof was highly regretted by the Emperor Octavius Augustus. The laws of the Cretans were likewise engraved in bronze; and the Romans etched, in general, their code *plebiscita*, contracts, conventions, and public records, in brass, not only during the existence of the republic, but likewise under the reign of the Emperors. The magistrates of Athens were chosen by lot; the names of the candidates were written on bronze plates, and put in an urn, with white and black beans, and the person whose name was taken out with a white bean was elected.

The pacts between the Romans, Spartans, and the Jews, were written on brass, which method was likewise observed by the guilds and private persons who usually, for security, got the land-marks of their estates engraved on metal; and in many cabinets are yet to be seen the discharges of soldiers written on copper-plates. It is not long since, at Mongheer, in Bengal, a copper-plate was dug up, on which characters

rafters of Sanfcreet were etched, signifying a gift of land, from Bideram Gunt, to one of his subjects. • This bill of feoffment, on copper, is dated 100 years before the birth of Christ, and proves at the same time that the Indians were, about two thousand years ago, in a high degree of cultivation. Such genuine documents, written on such hard substances, in more modern times are very scarce. The Archbishop Adelbert, of Mentz, ordered a grant to be engraved on metal plates, which privilege is kept over the door-wings of the church B. *Marie Virginis ad gradus*, in Mentz; and, in 1011, these door-wings were manufactured of cast metal, resembling bronze, by the Archbishop Willigis.

The Abbot Cabent, and the Benedictine Monk Legipont, entertain the opinion, that the most ancient writing material which has been used was wood. It is certain that box-wood and ivory have in those times been usually made use of to write upon, but of the precise time nothing can be ascertained with certainty.

Isaiah (chapter xxx. verse 8), and Habakkuk (chapter ii. verse 2), make mention of writings on a table, that it may be remembered for the time to come, for ever and ever. Solon's Civil Laws were written on boards, which were placed in a machine, constructed to turn them easily, called *axones*; and, even in the fourth century, the laws of the Emperors were published on wooden tables, painted with ceruse, which gave rise to the expression in Horace: *Leges incidere ligno*. The Swedes had the same custom, for which reason the laws are still by them

them named, *Balker*, originating from a piece of timber, called *Balken*, which is a balk or beam.

The Greeks and Romans used commonly, at an early period, either plain wooden boards, or covered with wax. The Greeks called wooden boards which were not covered with wax, *Schedæ* or *Schedulæ*. On such *Schedulas* was written, in the Hebrew language, the Gospel of Matthew, which, according to Baronius, in his *Martyrologio Romano*, was found in the tomb of the Apostle Barnabas. Those overlaid with wax were named *Pugillares cerei*. Persons who would privately correspond, or give secret intelligence to others, wrote it on plain wooden boards, on which they laid wax after they had written on the wood. Pliny assures us, that the writing on wooden boards was a custom even before the Trojan war. Such boards have been sometimes simply named *Cera*, from which originate the description *Cera prima*, *Cera secunda*, *Cera tertia*, &c. which signifies the first, second, and third page. The ancient Jurists unite often the words *Tabula* and *Cerae*. It appears notwithstanding, that they describe under the denomination of *Tabulis*, a carefully written work, and under that of *Ceris* and *Pugillaribus*, they comprehend a careless written manuscript, or copy of writing. Numerous testaments have been made on *Tabulas ceratas*. But I recommend attention to the stated boards or tables, to prevent misrepresentation; because, under the general description of *Tabulæ*, is often understood not only wooden boards, but also stone, ivory, and metal tables and plates.

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The Romans employed for common use, and principally for writing letters, small boards of common wood, overlaid with bees wax, which were sealed in linen clothes; and, if the last will was written upon these boards, they were run through, and joined together with lace or tape. They used likewise very thin levelled boards, of soft wood, named, according to Martial, *Tenuēs tabellas*, which were not overlaid with wax, but in which the letters were carved.

In the archives of the town-hall in Hanover, are kept twelve wooden boards, overlaid with bees wax, on which are written the male and female names of owners of houses, and of houses without noticing the streets; but, as Hanover was divided, in 1428, into streets, we have reason to believe, that these wooden manuscripts are more ancient. These boards are apparently of beech wood, and have on the four corners an elevation, and the places within are filled up with green wax. The first and last table serve, at the same time, as a cover, and are, therefore, only on one side overlaid with wax, but the others on both sides. These twelve boards form therefore only twenty-two pages; the outside boards are joined by a piece of leather pasted on them, to form the back of the book, and the leather is fastened, by nails, to the other ten boards. This curious manuscript book is 1 foot 5 inches high, 8½ inches wide, and about 5½ inches thick, or each leaf about ½ an inch. There is, besides the before-mentioned elevation on the four corners, another cross elevation, which divides every sheet into four square columns: on each page are between sixty and seventy lines of Monkish letters, which are

apparently pressed in the wax with a fescue. Seven pages are in good preservation. Another manuscript, much like this, is in the gallery at Florence, in the third room in the eleventh scrine; another in the city library of Geneva; and several are still existing in other libraries and archives.

The rich Romans used, instead of wooden boards overlaid with bees wax, thin pieces of ivory, named *libri eborci*, or *libri elephantini*; and Ulpian states, that the principal transactions of great princes have been usually written with a black colour on ivory. Flavius Vopiscus says, that there was a book of ivory in the library of Ulpian. The existence of ivory books has been fully ascertained by Martial, Salmasius, and Schwarz, notwithstanding other authors have held out, that the name of *libri elephantini* originates from the enormous size of these books, or from the intestines of elephants, on which they have been written; but this is certain, that only the great and the rich were able to use ivory tables, because they were scarce and dear.

It must be observed, that these with wax overlaid wooden tables were of different sizes; and, according to Quintilian, likewise used to teach writing to beginners; and, according to Cicero, it seems that the critics were accustomed by reading wax manuscripts to notice obscure or wrong phrases, by joining a piece of red wax. The Greeks and Romans continued still to make use of such boards, even at the time when writing on leaves of trees, on Egyptian Paper, on membranous substances, and on parchment, was already adopted, because they

could thereupon put down their fugitive ideas, and change or correct them easily, before they wrote on other substances; and it has been proved, that even when linen Paper was first discovered, such boards have been sometimes made use of. The Chinese have, in very ancient times, likewise written with iron large tools on boards, pieces of bamboo, and occasionally on metal.

The use of boards was superseded by the use of the leaves of palm, olive, poplar, and other trees. According to Pliny, the Egyptians were the first who wrote on palm leaves, for which reason their letters obtained the name of Phœnixcian letters, because the Greeks called the palm-tree *Phœnix*. In the library of the city of Strahlsund is a book still to be seen, written on palm leaves. The Malabars yet write on leaves of the palm, *Corypha umbra culifera*, and form the letters with a fescue at least twelve inches long, and anoint the leaves afterwards with oil. The written letters are rolled up. Their books are of many such leaves, which are joined together with a tape, and framed between two thin boards of the same size. There are still Bibles preserved, written on such leaves; one is to be seen in the library of the university of Gottingen, containing 5376 leaves, formed into 45 sheets, which has been purchased from Baumgarten, in a public sale; another is at Copenhagen; and one in the Orphan's house, at Halle. The explanation of twelve large volumes, with plants of Malabar, to be seen in the Academical Museum, at Gottingen, is mostly drawn with a fescue on palm leaves. In Hesselberg's Library, at Copenhagen, was a part of the New Testament, written in the Malabar language, on palm leaves. The Bramin manuscript,
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in the Kulingiennian language, which was sent from Fort St. George to Oxford, is of Malabar palm leaves; and Mr. Asple states, in his Origin and Progress of Writing, (chapter iv. page 49,) that in Sir Hans Sloane's library were more than twenty manuscripts of palm leaves, written in different Asiatic languages; and he says, (chapter viii. page 203) that he himself is in possession of a manuscript, written on palm leaves, in the Peguan language, which is 21 inches long, and $3\frac{1}{2}$ inches wide; the ground of which is richly ornamented with gold, and the letters are inlaid with a black gummy-like substance.

Knox states, in his History of Ceylon, that there grows a kind of palm tree, of which the leaves are woolly, and of considerable breadth, named the panaga tree, which are used by the inhabitants for writing, after having taken off the outer skin. They use talipot tree leaves for the same purpose.

The sentence of banishment (*petalismus*) of the Syracusans was written on olive-tree leaves; and on the same kind of leaves were written the names of those who were excluded from the Senate of Athens, which punishment was called *Ekphillophoresis*. The East Indians have, and still use, in some parts, leaves for writing. And, according to *Helvetius Cinna*, poplar-tree leaves have been likewise used.

The inhabitants of the Maldivia islands write on leaves of the macarcquo tree, which are three fathoms long, and one foot wide; and sometimes on thin wooden boards after they have been painted white. In many places in the East Indies, the leaves of

musa or banana tree were used for writing, till the Europeans introduced paper; and in the island of Java they still write on the leaves of the lanter tree, which are very smooth, and five or six feet long. Several other eastern nations use, for that purpose, the leaves of the cocoa tree, the taon-conder tree, and of a tree named, by the Malays, olen, which grows every where plentifully in that country, and is a kind of wild palm tree, the leaves of which are about $1\frac{1}{2}$ yards long, and 3 inches wide; for extensive writings they are tied together. The letters are written thereon with an iron tool, which pierces the outside covering, and makes indelible letters, which method is preferred by the Indians, because they are ruled by the touch and not by the eye: those leaves have a quality which makes them preferable to our paper; they are not only very strong, but, if they remain even for a long time in water, they are not liable to rot or grow tender, and the writing is not destroyed, for which reason the natives continued to use them, notwithstanding many paper-mills have been erected in India. It is remarkable, that poplar-tree leaves were principally used for sacred writings, which may be the reason why Pythagoras calls the leaf of the poplar tree, a sacred leaf.

The custom of writing on leaves of trees was superseded by the use of the raw bark of trees, and the interior bark of the lime tree, of which Suidas remarks, that it resembles *Papyrus*; and also the bark of elder, elm, and birch tree. The exterior bark (*cortex*) was seldom used, being too coarse in general, and not sufficiently smooth to write on legibly and easily. The interior bark (*liber*) was therefore preferred, being smooth
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and fine. From this originates the Latin name for a book. To carry those barks commodiously in the pocket, they were rolled up, and called *volumen*; which name has been continued for rolls of paper and parchment, and for books, notwithstanding our books have a very different shape. The name *codex*, or more properly *caudex*, still in use, originates in a like manner; and notwithstanding its true meaning is the trunk of a tree, it was adopted to describe many sheets of the said bark together.

The shape of the bark on which the ancient Europeans wrote was not all of the same size, and those manuscripts are very scarce. Montfaucon says that there are none in Italy, and that he found only one in the archives of the city of St. Denis, in France. Cragus saw in the city of Chur, in Switzerland, some verses of Virgil written on the interior bark of the birch tree. It is stated in *Acta Petropolitana*, tom x, page 449, that many whole books of this kind have been found in Siberia, the letters of which were in the language of the Calmuks. The ancient favorite song: *Eija mit hierta ratt innerlig*, &c. was called the Birch song, because Elfa, the daughter of Andres, had originally written it on the bark of a birch tree. The protocols of the Emperors were in these times written on the same writing-material to prevent falsifying, because, if the surface was shaved in the smallest degree the letters were destroyed, and could not be replaced by others. Several nations use it still for writing, notwithstanding paper is well known to them. Mr. von Justi asserts that he possesses a letter written, in the Malabar language, on the bark of a tree; and the Orphan-

house at Halle, in Germany, possesses likewise a large manuscript. In Sir Hans Sloane's library, was a manuscript written in Pattanian characters; and a letter of a Nabob, two yards long, richly ornamented with gold. In the British Museum are several pieces of the exterior and interior bark of trees, written on; and many more are in other British libraries. In the gallery of the Grand Duke of Tuscany, at Florence, in the 3d apartment and the 11th partition, are several writings on bark, but not ancient: but of the antiquity of a very great number of the like manuscripts in the Vatican library, in Greek, Hebrew, Arabic, and Latin, there is not the least doubt. To this succeeded the method of painting the letters with pencils, on linen and cotton:—whether these cloths were of the same kind as those now in use, cannot be ascertained. According to Symmachius, the prophecies of the Sybils were written on linen cloth. And Livy states the same, of the annual registers of the Romans. But Pliny says, linen was only used for writing in private affairs, notwithstanding, Livy and Claudian have proved the contrary; and in the Theodianian Codex (tit. xxvii. cap. 11.) is mentioned a law, written on *mappas-linteas*. The Chinese wrote two thousand years ago, before they invented the art of making paper, on pieces of linen or silk, cut to such a size as they wished to have the book. It was not usual for the Greeks to write on linen. Count Caylus remarks, that there were found, sometimes in the boxes containing Egyptian mummies, very neat characters, written on linen. It seems natural, that all linen, used for writing, must have been steeped in size or gum, or the ink and paint must have blotted.

Of the inhabitants of Partha, it is said that they wrote upon the same stuff of which they made clothes. And some Indians write yet on a kind of cloth, named *Syndon*. But, as linen was too much subject to become mouldy, animals were then attacked, to furnish stuff for a writing material:—their skins (*coria*) were principally used to write upon, after they had been tanned on both sides: those of sheep, goats, and asses were preferred. Several books, written on these, were in the Vatican library; in that of the King of France; and in several others. In the convent of the Dominican monks at Bologna, are two books of Esdras, written on asses skins, which are said to be the original manuscripts of Esdras himself: but it is certain that it has been written only about five hundred years ago, and it looks like leather. This copy was given to the Prior Aymerico, of that convent, by a Jew, in the commencement of the fourteenth century.

The ancient Persians and Ionians wrote on hides from which the hair was scraped. And the shepherds in former times wrote their songs with thorns and awls on straps of leather, which they wound round their crooks.

The Icelanders scratched their *runes*, a kind of figurative writing, or hieroglyphic, sometimes on walls: and it is noticed in the *Laxdaela Saga*, that Olof, at Hiardarhult, has built a large house, on the barks and spars of which he has got engraved the history of his own and more ancient times: and Thorkil Hake wrote his own deeds, in those hieroglyphics, on his chair and bed. The most ancient *runes* are traced to the

third century ; and the most ancient historian, who mentioned them, is Venantius Fortunatus, who lived in the sixth century.* Of these letters, or hieroglyphics, there were no more than sixteen in the whole ; but as, in the year one thousand, the Christian faith was introduced in Iceland, they were found insufficient, and Latin letters were adopted.

Puricelli maintains, that the Italian Kings, Hugo and Lotharis, had given a grant to the Ambrosian church, at Milan, written on the skin of a fish.

Not only the skins of animals were used for a writing substance, but also bones and entrails, if they were thought to be fit for that purpose. In the history of Mahomet, is slightly noticed, that the Arabians took the shoulder-bones of sheep, on which they carved remarkable events with a knife ; and, after tying them with a string, they hung their chronicle in their cabinets.

In the library of the Egyptian King Ptolomæus Philadelphus, which is said to have contained 700,000 volumes, were the works of Homer, written in golden letters on the skins of animals : and under the reign of the Emperor Basiliskus, was burned, at Constantinople, a manuscript 120 feet long, written on the intestines of beasts, &c. in golden letters, containing Homer's Iliad and Odyssæy. In the library of the Emperor Zeno Isauricus were likewise Homer's works, painted

* He says in Carm. vii. 18, *Barbara fraxineis pingatur Runa tabellis.*

in golden letters on the entrails of animals : and we know, from Isodorus, that the intestines of elephants have been also used for writing.

But these writing-materials were not in general use, but were regarded as a rarity. There is in his Majesty's library at Hanover a letter, engraved on a golden plate, written by an independant prince of the coast of Coromandel to King George the Second, which is about 3 feet long and 4 inches wide, and inlaid on both the narrow sides with diamonds, which was delivered to the late Mr. Scheidt, to be kept in his Majesty's library at Hanover.

We arrive now at the period when the Egyptian Paper was invented, and manufactured from the rind of the Paper-plant, *Papyrus*, which grows in the marshes on the borders of the Nile, and is called in the Egyptian language *Berd*, or *al Berdi*. Theophrastus, Pliny, Guilandin, Prosper Alpin, and other authors, describe the Egyptian Paper-reed to be a plant of the rush kind, which grows in swamps about 10 cubits long. The stalk is triangular, and of a thickness to be spanned ; surrounded, near the root, with short leaves, but naked on the stalk. This stalk has on the top a bush, which resembles in some respects a head with hairs, or of long, thin, straight fibres ; the root is brown. After Pliny, Guilandin furnishes us with the best description of the *Papyrus*, and the method how it is prepared for the use of writing ; all other subsequent authors have, more or less, copied them.

The Egyptian Paper-reed which according to Strabo grows only in Egypt and India, and of which in the year 79, after the birth of Christ, a species was found in the Euphrates near Babylon, which was equal in quality to the genuine Egyptian *Papyrus* for making Paper, must not be mistaken, as Ray and others did, for the Papero-plant growing in Sicily, which much resembles the other. Lobel has given a description of the Sicilian Papero, in his *Adversarius*, and it does not seem that it has been used in ancient time for making Paper: it is only lately that the Chevalier Savario Landolina has sent samples of Paper to the society at Gottingen, manufactured from this plant; according to the description which Pliny has given of the manufacture of *Papyrus*.

Many authors believe that the Egyptian Paper-plant is no more existing, which does not seem likely, because it was a plant in many respects of the rush kind; but by the changes which the soil in that country has experienced, it may have become scarcer. Nevertheless, it is not noticed by Pocock; and Shaw notices it only amongst the hieroglyphics of the ancient Egyptians. Maillet observes (which seems to be improbable), *Je serais cependant assez porté à croire, que ce n'est autre chose que la plante appelée au Caire figuier d'Adam, et par les Arabes Mons.* Most of the modern geographers, who describe Egypt, take no notice of this plant, which may lead us to believe that they have either no knowledge thereof, or thought it no object of consequence, but not that it exists no longer: and, as Pliny states that *Papyrus* was not only
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used for making Paper, but for numerous other purposes, which he describes, we must presume that care would have been taken to preserve such an useful plant.

The Egyptian Paper was manufactured from the fine pellicles of the *Papyrus* which surrounded the trunk (the finest of which were in the middle), and not from the marrow of the plant. These pellicles were separated by means of a pin, or pointed muscle shells, and spread on a table sprinkled with Nile water, in such a form as the size of the sheets required, and washed over with hot-glue-like Nile-water. On the first layer of these skins, a second was laid cross-wise to finish the sheet, (*Plagula*) which was pressed, hung up to dry, and smoothed and polished with a tooth. The Nile water was laid on with great care, to prevent spots in the Paper. Twenty skins were the utmost which could be separated from one stalk, and those nearest to the pith made the finest Paper.

Twenty sheets, glued together, were called *scapus*, but sometimes several *scapi* were glued together, to form a large *volumen*. This part of the business was executed by the *Glutinatoris*, the work of whom resembles in many respects that of the bookbinders in our time. All persons who worked in these Paper-manufactures had names according to their work.

With respect to the time when this Paper was invented there are different opinions; and even the name of the inventor
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is unknown. Some authors have tried to prove its antiquity from Homer, Hesiod, and Herodotus, and conjectured that Moses had written his books on Egyptian Paper, whereas Varro states that the invention was not known in the time of Alexander the Great, which is about 400 years before the birth of Christ; but as Aristotle mentions the book-moths as well-known insects, it seems likely that the invention is more ancient; and Pliny refutes Varro, by quoting Cassius Hemina, who states that a writer named Terentius, by digging a piece of land on the mountain Janiculum, found in a stone box the books of Numa, written on Egyptian Paper, which was completely preserved, notwithstanding it had been 850 years buried in the earth, because it had been steeped in oil of cedar; and that Mucian, who was three times consul, had assured him, that during the time he was commander-in-chief in Lycia, he had seen there, in a temple, a letter of the Lycian King, Sarpedon, written on Egyptian Paper. It is true Guilandin has proved that the Paper-reed was known long before the reign of Alexander the Great, which he states was used for several purposes, but thereby cannot be positively ascertained that it was used as Paper-stuff.

The Paper manufactured in Egypt was rather of an inferior quality, and the Romans prepared it more carefully, and paid more attention to the washing, beating, gluing, sizing, and smoothing, than the Egyptians. They sized it in a similar method as we do rag-paper, but they made their size of the finest flour, which was stirred in boiling water with a few drops of vinegar and some leven, and then filtered. It was after the first

fize beat with a hammer; fized the second time, pressed, and then smoothed. This Paper of the Romans was very white, and, according to Pliny, never more than than 13 inches wide.

Pliny and Ifidorus have informed us that the Romans had several sorts of Paper, to which they had given different names. Pliny mentions eight of these.

1. *Charta Hieratica*, of which were four different sorts.

a. *Charta Hieratica*. This was a Paper not cleaned at all.

b. *Charta Augusta*, (so called to pay respect to the Emperor Augustus) was improved by one cleaning.

c. *Charta Liviana* (named after the Empress) which was rendered superior by a second cleaning.

d. *Charta Hieratica*. This name was likewise given to Paper in full perfection.

The Romans named these four assortments in general *Charta Hieratica*, or Holy Paper, because it was principally used for sacred books and writings. All was 11 inches wide.

The *Charta Augusta* had at first the preference, but being too thin for the writing-cane, in the 50th year after Christ, under

the reign of the Emperor Claudius, it was improved by lining the Augustan Paper with an underlaying of the same Paper, which gave the name to

2. *Charta Claudia*. This Paper was better than *Charta Augusta*, and 2 inches wider. I must observe, that all books preserved in the *Herculaneum* are written on Paper not underlayed; and that the first Paper was only written on one side. The *Adversaria*, of which Pliny the elder left 160 volumes, were the only books preserved in which the leaves were written on both sides, two leaves being pasted together. It is said that Julius Cæsar was the first who wrote *opisthographically*, but only when he wrote letters to confidential friends.

3. *Charta Fannia*. *Palæmon*, a celebrated grammarian, had in the year 5, several public work-shops, in which this Paper was prepared with more skill: it was usually used for writing plays upon. It was 10 inches wide, and glazed with a tooth, ivory, or muscle-shells.

4. *Charta Amphitheatrica*, which was much coarser than the before-mentioned sorts, and only 9 inches wide.

5. *Charta Saitica*, which was only made in the city of Said, Salo, or Sahid, from the cuttings or shavings, and refuse of other Paper, which was gathered throughout the country, and re-manufactured in this city: it was not full 9 inches wide.

6. *Charta*

6. *Charta Tanitica*, which obtained that appellation from the city of Tanic, now Damietta.

7. *Charta Emporetica*, or shop-keepers' Paper, which was used to wrap goods in, was manufactured from the next pellicle under the rind of the Papyrus, and sold by weight; but, being only 6 inches wide, it was found to be inconvenient for covering and packing of goods. It has been called by some *Leneotica*.

8. *Charta Macrocolla*, or only *Macrocollum*. It received its name from its large size.

Several authors mention other sorts: *Charta Libyana*, *Charta Thebaica*, *Charta Carica*, *Charta Memphitica*, *Charta Corneliana*, after Cornelius Gallus, who was the first that had this Paper manufactured. *Mellonis Pagina*; *Charta Blanca*; it obtained its name from its beautiful whiteness: this name is yet applied to a blank sheet of Paper, which is only signed. *Charta Nigra* was the name of Paper painted black, and the letters written thereupon were of white and other colours.

The Egyptian Paper was manufactured in Alexandria and other Egyptian cities, in such large quantities, that Vopiscus speaks of Fermies having boasted, that he possessed so much Paper, that its value would maintain a large army for a long time. Alexandria was for a considerable time solely in possession of this manufacture, and acquired immense riches, which was noticed by the Emperor Adrian. At the end of the 13th century

ture the commerce with Egyptian Paper was still flourishing, and continued to the 5th century, notwithstanding the high imposts thereon, which induced King Theodoric, *after these imposts were*, at the latter end of the 5th century, *greatly increased*, to deliver Italy therefrom at the commencement of the 6th century. Cassiodorus wrote on that subject a very remarkable letter (the 38th letter in his 11th book) congratulating the whole world on the cessation of an impost on an article of commerce, so necessary for the convenience and improvement of mankind.

It was used occasionally in Italy until the 11th century, but not generally, by reason of its laborious, difficult, and expensive manufacture, and that the use of Parchment and Paper made of cotton became gradually introduced. Several authors differ again in stating the exact period when the use of Egyptian Paper was dropt; but this difference may originate from mistaking the Paper made of Papyrus for that of the bark of trees, which was even continued to be used in the 12th century, and shall be mentioned hereafter.

Some of that Paper is preserved to the present time. It was already known in France in the 5th and 6th centuries. Mabilon quotes several acts still existing, written on Paper manufactured from the Papyrus, by the Kings Childebert the First and Clodovic the younger; and Gregorius Turonensis affirms in his letters, that it was generally used at an early period in the French Chancery. In the Abbey of St. Germain des Prez, at Paris, was a complete work written on Egyptian Paper. In
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the Royal Library at Paris was the *Charta plenariæ potestatis*, written on the same Paper. And Mabillon remarks that several such manuscripts, written in the 6th century, were in the Library of Mr. Petau.

In the Cottonian Library are four leaves of this Paper, on which the gospel of St. Matthew and St. John are written.

Italy can produce several explanations of the Psalms, manuscripts of the Fathers of the Church, Public Acts, &c. written on Egyptian Paper: amongst them I must notice a scarce relic of the treasury of St. Mark, at Venice, which is the gospel of St. Mark, written by himself, of which some leaves have been conveyed to Prague, by the Emperor Charles IV. It is kept with great veneration and care in a silver case gilt, which is in the form of a book, and considered to be the most precious piece of the whole treasury, notwithstanding no person is able to distinguish a single letter, being so much injured by time, that it tumbled to ashes when only touched. Zanetti discovered in the cabinet of Mr. Nani, a diploma of Papyrus, a Venetian ell long, and half an ell wide. And lately was found, in the archives at Florence, a document which is apparently written between the years of 454 and 469, of six feet by two; many others are existing in Italy, too numerous to specify.

Amongst the several documents written on Egyptian Paper, at Vienna, is a diploma of Pope Benedict III. of 21 feet by 2: and a document in Latin, which is entirely preserved. The record of Ottokar, King of Bohemia, is likewise written on Egyptian Paper.

In the Electoral Library at Munich, is a manuscript on reed ; and in the Library at St. Gall in Switzerland, is a Codex of this Paper, on 30 leaves in quarto, written in the 7th century, with *Uncial* letters, containing the *Homilias St. Augustini et Iſidori*. In the Library at Geneva are two manuscripts, according to Mabillon and Montfaucon, of the 4th and 5th century. I could quote many more remains of Egyptian Paper, noticed by Mabillon, Vacchieri, Gerkenſ, Lambecius, and other authors ; and other manuscripts lately diſcovered by ſcientific travellers ; but, as it would extend this account beyond my intended limits, I ſhall now turn to another Paper-material, which is more ancient than the Paper of Papyrus.

Charta Corticea, or Paper of the Bark of Trees, manufactured of the *membrana ligni tenuiori*, and likewise uſed for writing, is difficult to be diſtinguiſhed from the Egyptian ſhrub-paper, called *Charta papyracea ex pelliculis herbæ Ægyptiacæ*, and therefore often conſidered to be the ſame ; and ſeveral authors deny it ever to have exiſted. But if they had carefully examined theſe two ſorts, they would have diſcovered their error, and the difference.

The *Charta Corticea* has been, as aforeſaid, made of the fine ſkinny ſubſtance ſeparated from the interior ſide of the bark of ſuch trees as were fit for that purpoſe, which has been moſt likely formed into Paper by waſhing, beating, and plaining, like the Paper of Papyrus. But it had always three or four couches, which were glued together, and was therefore through its thickneſs not only more brittle, but the united pellicles often ſeparated ; principally the upper couch which was written on,
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and the writing became, therefore indistinct and useless. The *Codices* of *Charta Corticea* are for the major part written in Latin, which gives us reason to suppose, that it was used principally in the western countries, where the Egyptian Paper could not be obtained, or was very expensive, and the inhabitants were therefore obliged to try to make their own paper. All ancient documents in Germany which are not written on parchment are in general on Paper made of silk, wool, and the bark of trees; but these on Paper made from Papyrus are scarce, and an experienced eye is only able to distinguish one from the other. In the Abbey of St. Germain is one, the upper couch of which has disappeared with the letters. In the archives of the church at Gironne are preserved the bulls of the Popes Romanus and Formosus, of the years 891 and 895. They are about six feet long, and three feet wide, and are apparently formed by gluing the skins or leaves couchwise one to the other; and the writing remains legible in different places. The use of this Paper continued in France till the 12th century.

That, in the most ancient times, skins and hides of animals have been used as a writing material I have before stated. In more modern times the skin between the hide and the flesh was separated, scraped, and by working and rubbing with quicklime, were formed into leaves, and called *Membrana*. They were used by the Hebrews and Greeks; and the Jews maintain that their ancestors used them for writing on the Mountain of Sinai. It is certain that the Jews had at the time of David, books of the skin of animals rolled up called *Mgilloth*; and Herodotus assures us, that in remote

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times the skins of sheep and goats were the usual writing materials about 440 years before Christ. That the ancients have used skins of different animals for that purpose is apparent, by the words, *Membrana caprina, agnina, ovilla, vitulina, et hœdina*, which are found in several authors.

But such membranes are very different from the true parchment, *Chartam Pergamenam*.

Ptolomæus the First,* King of Egypt, who died in the year of Rome 470, established in Alexandria, a very extensive library, which was much enlarged by his son Ptolomæus Philadelphus, with the assistance of his librarian Demetrius Phalereus. Eumenes, King of Pergamus, contended with, and endeavoured to surpass him if possible, which created jealousy, and caused Ptolomæus to prohibit the exportation of Egyptian Paper, under heavy penalties. It may be that this prohibition was not solely occasioned by jealousy, but from the fear that his dominions, which were so much improved in arts, sciences, and civilization, since the discovery of Paper, would be again reduced to a state of ignorance for want of Paper, because the plant failed sometimes in unfavourable weather. The Pergamians were therefore obliged to devise other means for making Paper, and they discovered the manufacture of useful parchment, about 300 years before Christ, and in the 5th century of Rome, which obtained its name from the city of Pergam, or Pergamus, in Asia (now Pergamo), the place where it was invented, and the art of bringing it to such a state of

* Sometimes named *Soter* and *Lagus*.

perfection,

perfection, that according to Prideaux and Freret, it greatly surpassed the Egyptian Paper in fineness, smoothness, and strength; and the art of making it very thin arrived in a short time to a surprising degree of perfection. Rome manufactured the best parchment. The first inventor could only manufacture yellow parchment; yet in Rome it was soon improved, and made white: but as that delicate colour was too liable to tarnish and spot, it was only made white on one side, and the other left yellow; and if it was to be used for writing on both sides, it was coloured violet and purple, and the letters were written thereon in gold or silver. Gold was only used for sacred writings, and principally for the Psalms and Gospel.

All the world at that time did not use Paper and Parchment alone for writing upon, but stones and metals; the last was chiefly used on account of its durability, and all nations had not attained a knowledge of the useful inventions of the Egyptians and Pergamians. Parchment came into use in Europe not before the 6th century, which increased in the 8th and 9th; and England and Germany made very little use of Egyptian Paper for diplomas, but parchment, till the year 1280. I am informed that before the invention of Rag-paper, nothing else was used in Germany for diplomas than parchment; and, notwithstanding, no map of parchment made before the 6th century has been discovered.

With respect to the size, length, and width of the parchment, it was not regulated like the Egyptian Paper, and there are documents as small as our playing-cards. There was likewise

no adopted rule, if written at length or at the sides ; it depended on every one's fancy : but as it commonly was used only on one side, it was more generally written sidewise than lengthwise, to save space. When printing was invented, parchment was likewise printed upon ; and at Berlin, Brunswick, Paris, and St. Blaise,* are copies of a bible, printed in the year 1450, on parchment, in three folio volumes. At the University library at Helmstadt is the *Officia Ciceronis* : and from the library of the late Mr. von Duve was sold, by public auction, the very scarce work, printed on parchment, *Chronica Figurata totius mundi a Hartm. Schedelio, Doct. Norimb.* of Anton. Koberger, printed in folio, 1493, with copper-plates.

Parchment should be only made of calf-skins, to be entitled to its name ; but it is in modern times likewise made of the skins of sheep, goats, asses, and hogs. I shall not enter into a description of the manufacture of parchment, or repeat the various ways in which it is used, new or old, but only observe that in France there is annually the value of upwards of a million of livres of parchment manufactured.

I shall now continue my historieal account, and observe, that it is erroneous to state that the Arabs invented, in the 8th century, the manufacture of Paper from cotton : and Casiri, who states it to have been discovered in the year 706, by Joseph Amra, cannot deny that it was known before

* An Abbey of the Benedictines, in the Black Forest, in the Bishoprict of Constance. The Abbot is a Prince of the German Empire.

that time by the Chinese and Persians. The Arabians are therefore not the inventors, and acquired the knowledge of making it only in 704, by their conquests in Tartary. This invention became then more generally known, but the art of manufacturing it was only imported in the 11th century into Europe; and neither is the year of its discovery precisely known, nor the inventor's name. The first paper of that kind was made of raw cotton; * but its manufacture was by the Arabians extended to old worn-out cotton, and even to the smallest pieces thereof.

But as there are cotton-plants of various kinds, it is natural that these must have produced papers of different qualities; and it was impossible to unite their woolly particles so firmly as to form a strong substantial Paper, for want of sufficient skill; and also for want of European mills (which are not yet established by the Moors, Arabs, and Turks, who make use of mortars, and hand and horse-mills), it was impossible they could bring their wool, by that method, and by boiling and

* This must have been unknown to *Guétard*, or he would not have stated that he was the first who had ascertained by experiment, that raw cotton-wool could be converted into Paper, without being previously used for clothing, or other purposes. It seems he has been misled by the Jesuit *du Halde*, who says that the Chinese made their Paper from cotton-rags. *Guétard* also asserts, that he was induced to make his experiments, because he had not found an author who mentioned the practicability of making Paper from cotton-wool; and that by beating it to a pulp he has made fine white Paper of it. But if he had read *Theophilus Presbyter* and *Monachus*, he would have been informed that in the Eastern countries it was customary to make Paper of cotton-wool.

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beating, to a fine pulp rendered intirely free from its woolly quality. Not discovering in such ancient cotton-paper, stripes or water-marks, or the prints of wire resembling those of our moulds, we must presume that their forms were not like our skilfully invented moulds, through which the water runs off, and the mass remains therein united.

The Christian disciples of Moorish paper-makers, who since 1085, were in possession of Toledo, and in 1238, of Valencia, worked the paper-mills to more advantage than their predecessors: instead of manufacturing Paper of cotton-wool (which is easily recognized by its being brittle and remaining always yellow), they made it of cotton-rags, in moulds through which the water ran off: for this reason it was called parchment-cloth. Beside these denominations, the historians of that time call it *Charta Xylina*, or *Gossypina*, from the cotton-plant; *Charta Bombycina*, from the shrub *Bombax*, by which name it was likewise described in England; *Charta Cotonea*; *Charta Damascena*; and *Charta Serica*.

All civilized nations used first the Egyptian and then the cotton-paper, but had not any idea of using linen for the same purpose; and to this day the Eastern nations who manufacture their own Paper, and even the Greeks, employ only cotton-wool and cloth for that use; and are so much accustomed to strongly glazed Paper, that when they receive Rag-paper from Italy and the south of France, they glaze it till it resembles our glossy linen cloth.

It is probable that the Greeks made use of cotton-paper sooner than the Latins; and that it was brought into Europe by the Greeks, earlier than by the Moors from Spain, there is no doubt. The Greeks received it from the Tartarian countries at the Bukarias; and through Venice it came into Germany, where it was known in the 9th century by the name of Greek parchment. Greece, so much connected by commerce with Asia and Egypt; Italy, which was already in the 7th century frequented by the Arabs; Spain, which they conquered in the 8th century, and possessed to the latter end of the 15th; were, without contradiction, the European countries where cotton-paper was first used. The Arabs manufactured, at Cebta (which is, according to Manjanfius, now Ceuta), a cotton-paper, called Cebti; and Spain being so near, could easily have been provided with it, until manufactories were shortly after established at Xativa, Valencia, and Toledo.

The stuff for this paper, cotton, was most likely cultivated in Spain by the people who had conquered it, because they came from a country where it was in general use, and they were therefore accustomed to it. There is yet more than one quality of cotton found in Spain, and that commodity is considered in the Kingdom of Valencia as a home production; and it is not unlikely that the predecessors of the Arabs, (the Phœnicians and Carthaginians,) introduced it into Spain. Swinburne calculates the produce of cotton, the growth of Valencia, at 450,000 arobes, value 350,000*l.* which is in some measure confirmed by Twiss, who saw,

between Cordova and Granada, several fields full of cotton-plants.*

The paper-manufactories at Xativa, Valencia, and Toledo, produced only very coarse cotton-paper till the Moors were driven from Spain, either by the Arabians or Christians. The Spaniards being acquainted with the use of water-mills, improved the method of grinding the cotton-wool and rags; and by stamping the latter in the mill, they produced a better pulp than the wool from which various sorts of Paper were manufactured, nearly equal to those made of linen-rags.

Spain still possesses residues of cotton-paper. At the convent of Silos, is a Latin vocabulary, of intermixed parchment and thick cotton-paper leaves, written in *Gothic* characters, the date of which must have been prior to the reign of Alphonfus VI. as the use of *Gothic* writing was forbidden in 1129 at the council at Leon. As very few manuscripts are found on cotton-paper from the 10th to the 12th century, but the major part on parchment, or intermixed, it must be supposed that at that time cotton-paper was scarcer than parchment, or that this mixture was necessary because sufficient parchment could not be obtained, and that the cotton-paper was too tender and more liable to break.

* Dillon, in his Travels through Spain, mentions cotton as a national production, and it is surprising that Ulloa, a Spaniard, in his *Retablissement des Manufactures et du Commerce de l'Espagne*, has omitted the mentioning of cotton.

The Arabian author, Scherif al Edrissi, certifies that in 1151 very fine white cotton-paper was manufactured; and Cacim Aben Hegi assures us that the best was made at Xativa.

The King, Peter II. of Valencia (or the fourth King of Aragon) issued, in 1338, a command to the paper-makers at Valencia and Xativa, under pain of punishment, to manufacture better Paper, which was to be equal to that formerly made. Mr. Meerman had in his possession a piece of very coarse cotton-paper written upon in 1339, which proves that the art of paper-making was neglected by the Spaniards; and that prior to the middle of the 14th century no linen-rag Paper had been manufactured in that country. This has been fully ascertained by the above gentleman, from the repeated examination of several pieces of Paper sent to him for that purpose. Notwithstanding, their scientific men persist in its being linen-paper.

Cotton-paper came into use in France shortly after its invention; and until 1311, no other Paper than this and the Egyptian Paper was known in that country.

At what period cotton-paper was introduced into England cannot be ascertained with accuracy. The most ancient manuscript which can be produced is of 1049: and it appears that its use continued till the latter end of the 14th century, and that it has been gradually supplanted by the linen-paper, which came into use in 1342. All documents written between

tween 1282 and 1347, which Ducarell erroneously states to be linen-paper, are written on cotton-paper, as is the *Carmina aurea Salomonis Regis*, in *His Majesty's* library, composed in the 14th century, in the Greek and Latin languages; at least there is no reason to doubt what Mr. Meerman states on this subject.

Of the introduction of cotton and linen Paper in Scotland, nothing can be ascertained; and it is singular that it has not been noticed by Thomas Ruddiman. The same is the case with Ireland. But discoveries may yet be made in these countries.

The knowledge of cotton-paper came by means of the Greeks to Italy; and the art of making it, in Sicily, through the invasion of the Saracens. It is certain there was no linen-paper used before 1367.

The bulls of the Popes Sergius II. John XIII. and Agapetus II. were written in the 8th and 9th centuries, on cotton-paper. Dufresne quotes under the article *Charta Cuttunea*, from *Rocchi Pyrrhi Sicilia Sacra*, a place where the family of a paper-maker is mentioned, but no time is noticed, notwithstanding a full account is given of a cotton-paper manufacture which we have not of any other country.

The large paper-manufacture at Fabriano, in the *Marchia Anconitana* (which, according to Bartolus's description, consisted of several different mills belonging to different persons, although

although the whole formed only one manufacture), was established long ago, but was enlarged from time to time, and manufactured, at the period when Bartolus wrote, nothing but cotton-paper. This author died in 1355 ; so that it seems that 1367, or thereabouts, was the time when linen-paper was brought into use in Italy : and cotton might have been some time before mixed with linen-rags, till the superiority of the latter was fully ascertained.

As soon as the use of cotton-paper was adopted in Italy, it was also introduced into Germany ; and, at the commencement of the 9th century, well known under the name of Greek parchment. Germany imported the Paper some time before it manufactured it ; and notwithstanding it received the stuff through the same channel as the Paper, and that cotton and flax were spun and wove in the 10th century, the manufacture of cotton-paper cannot be traced in Germany to such an early period : all that can be positively ascertained is, that in the middle of the 14th century, it was made by stamping-mills. But as Germany had in the 13th century, already cotton and linen manufactures, and exported considerable quantities thereof to Italy, it is fair to presume that cotton paper was also manufactured.

I now conclude the historical account of the several substances which have been used as writing materials, with the invention of linen Paper.

The Royal Society of Sciences, at Gottingen, has, in the years 1755 and 1763, offered premiums to trace the exact time of this discovery; and Mr. Meerman printed in 1762 at Rotterdam, *Gerardi Meerman, Syndici Roterodamenfis, Admonitio de Chartæ nostratis, seu lineæ, origine*, and offered 25 ducats to find it out. All researches were lost and reduced to an uncertainty through the cotton Paper, which was in use some centuries before the linen Paper, because these two are in many respects similar, and cotton and linen rags may have been at first mixed, which rendered it therefore difficult to ascertain when the first Paper was made from linen rags alone.

The Jesuit Du Halde attributes this invention to the Chinese; but as Gerbillon, and other modern travellers assure us that in the Paper-manufacture at Ming-hya, raw hemp was beaten and macerated with drugs, and then manufactured into Paper, this nation cannot claim the discovery of the art of making Paper from linen rags; and all authors agree that Europe is entitled to the merit of this invention, but they differ as to the time; some trace it to the 8th, 10th, and others to the 11th and 12th century; and it is most likely that Paper has been made from linen cloth before it was attempted to be made from linen rags.

Gregorius Manjanfius, of Oliva; Franciscus Perez, of Toledo; and Ferdinando Velasco, of Madrid, endeavoured to trace this discovery in Spain, but could not prove that their country was entitled to the merit of it, being completely defeated by a num-

ber

ber of other authors; and it seems that the Spaniards had no knowledge of linen Paper before the middle of the 14th century, and then it was not manufactured in that country, but imported; and it is most likely linen and linen-rag Paper were only manufactured in Spain a short time before the art of printing was introduced. Spain cannot therefore claim the merit of this invention; and soon after that they manufactured Paper from linen rags, these manufactories went to decay, because the Kings of Spain first granted monopolizing privileges to many convents for the manufacture of Paper; and when it came again into private hands, they fixed such a low price on printed books, of which the Genoese availed themselves, and procured considerable quantities of rags from Spain, principally from Andalusia; and in 1720, they send Paper back to Spain to the amount of 500,000 piafters. There are at present upwards of 200 Paper-mills in Spain, 31 of which are at Alcoi, and Francisco Guarro manufactures Paper as good as any Dutch.

France made an early use of linen Paper, but manufactures were later established there than in Spain and Italy. Lint or flax, was cultivated by the Gauls at an early period; but the clothing with linen became only a custom many centuries afterwards; and the authors of the 8th century quote as a remarkable thing that the holy Segolena was dressed in a linen shift, and that the Queen of France, wife of Charles the Seventh, was the first French Queen who wore shifts of linen cloth; which was in the 15th century. This is not a proof that no Paper was made of linen before that time. Several authors prove the use of linen Paper in 1270, 1294, 1320,

1302, 1314, and 1316, but not that it has been manufactured in France, and we have no account for several centuries what kind of linen Paper was made, which the authors would not have left unnoticed; and therefore no Paper manufacture can be traced before the 15th century. These manufactures became in a short time very flourishing, and the French soon exceeded their neighbours in the art of making Paper, and were therefore enabled to export considerable quantities, which encreased so much yearly, that in 1658, of 35 millions of livres exported in goods and merchandize to Holland, two millions in value were of Paper; and it provided Spain, England, Switzerland, Denmark, Sweden, Russia, but chiefly Holland and the Levant, with Paper for printing and writing. The Paper manufactures in Languedoc, Lionese, Guienne, Bretagne, and Poitou work principally for exportation; and the 14 mills in Alsace, which manufacture about 40,000 reams of Paper annually, export two-thirds thereof to Switzerland and Germany.

As the French still export a considerable quantity of Paper, I think it worthy of notice to state the names, length, width, and weight of all the different sorts of Paper, now manufactured in France.

Names.	Length.	Width.	A Ream should weigh.	And at least.
	In. Lines			
Grand Aigle	24 9	36 6	131lb. and upwards	126lb.
Grand Soleil	24 10	36 0	112lb. not exceeding 120lb	105
Au Soleil	20 4	29 6	86 and upwards	80
Grand Fleur de Lis	22 0	31 0	70 not exceeding 74	66
Grand Colombier ou Imperial	21 3	31 9	88 and upwards	84
A l'Elephant	24 0	30 0	85 ditto	80
Chapelet	21 6	30 0	66 ditto	60
Petit Chapelet	20 3	29 0	60 ditto	55
Grand Atlas	24 6	26 6	70 ditto	65
Petit Atlas	22 9	26 4	65 ditto	60
Grand Jesus ou Super Royal	19 6	26 0	53 ditto	48
Grand Royal etranger	18 0	25 0	50 ditto	47
Petite Fleur de Lis	19 0	24 0	36 ditto	33
Grand Lombard	20 0	24 6	36 not exceeding 40	32
Grand Royal	17 10	22 8	32 and upwards	29
Royal	16 0	22 0	30 ditto	28
Petit Royal	16 0	20 0	22 ditto	20
Grand Raifin	17 0	22 8	29 ditto	25
Lombard	18 0	21 4	24 ditto	22
Lombard ordinaire	16 6	20 6	22 ditto	20
Cavalier	16 2	19 6	16 ditto	15
Petit Cavalier	15 2	17 6	15 ditto	14
Double Cloche	14 6	21 6	18 ditto	16
Grande Licorne à la Cloche	12 0	19 6	12 ditto	11
à la Cloche	10 9	14 6	9 ditto	8
Carré, ou Grand Compte, } ou Sabre, Sabre au lion }	15 6	20 0	18 ditto	16
Carré très mince	15 6	20 0	13 ditto	13
A l'écu, ou moyen compte, } Compte ou Pomponne, }	14 0	19 0	20 ditto	15
à l'écu très mince	14 2	19 0	11 ditto	11
Au Coutelas	14 2	19 0	17 ditto	16

Names.	Length.	Width.	A Ream should weigh.	And at least.
	In. Lines.			
Grand Meffel	15 0	19 0	15 and upwards	14
Second Meffel	14 0	17 6	12 ditto	11
à l'étoile, à l'éperon, ou longuet	13 10	18 6	14 ditto	13
Grand Cornet	13 6	17 9	12 not exceeding 14	10
Grand Cornet très mince . .	13 6	17 9	8 and less	—
Champy, ou Bastard	13 2	16 11	12 and upwards	11
à la Main	13 6	20 3	13 ditto	12
Couronne, ou Griffon . . .	13 0	17 1	12 ditto	10
Couronne, ou Griffon très } mince	13 0	17 1	7 and less	—
Telliere grand Format . . .	13 2	17 4	12 and upwards	10
Cadran	12 8	15 3	11 ditto	10
La Telliere	12 8	16 0	12½ ditto	11½
Pantalon	12 6	16 0	11 ditto	10
Petit Raifin, ou Bâton Roy- } al, ou Petit Cornet à la grande forte	12 0	16 0	9 or less	8
Les trois O ou trois ronds, } ou Genes	11 6	16 0	9 and upwards	8½
Petit nom de Jesus	11 0	15 1	7½ ditto	7
Aux armes d'Amsterdam } Pro Patria ou Libertas	12 1	15 6	12 to 13	12
Cartier grand Format, Dau- } phine	13 6	16 0	14 and upwards	12
Cartier grand Format . . .	12 6	16 0	13 ditto	12
Cartier	11 6	15 1	11 ditto	10
Au Pot, ou Cartier ordinaire	11 6	14 6	10 ditto	9
Pigeon, ou Romaine . . .	10 4	15 2	10 ditto	8½
Espagnol	11 6	14 6	9 ditto	8
Le Lis	11 6	14 1	9 ditto	8
Petit à la Main, ou Main Fleurie	10 8	13 8	8 ditto	7½
Petit Jesus	9 6	13 3	6 ditto	5½

All forts which are less than 9 inches and 6 lines in length, are permitted to be made of such a width as may be required.

That Paper called *Trace*, *Tresse*, *Etreffe*, or *Main-brune*, and of the names *Brouillard*, and *à la Demoiselle*, and all coloured Papers may be manufactured of such length, width, and weight as ordered.

There are three sorts of French Paper which are exported to the Levant, that are not above described :

	Inches.	Inches.		
Aux trois Croissans, Façon de Venise,	12 $\frac{1}{2}$ 0 long,	17 0 wide	20lb.	0 oz.
Aux trois Croissans, ou trois lunes,	12 0	16 0	14	10
Croifette	11 6 lines,	15 5 lines	9	4

The Papers called *Couronne*, *Cartier*, and *à la Cloche*, if designed for the Levant trade, differ from the before-mentioned size and weight. In *Savary's Dictionnaire Universel de Commerce* are mentioned twenty different sorts of common Paper, made out of old nets and cords, maculated and blotting Paper, to which the French have likewise given different names, but I have omitted them, as they do not contribute to the knowledge of the commerce with Paper, nor to improve and extend our manufactures, which was the motive I had for giving here so long a detail ; whereas I have endeavoured to abbreviate this historical account, in other respects, as much as possible. I will now continue to describe the remaining sorts of Paper manufactured in France.

Demoiselle mince is made of the finest threads of nets, and being more stamped in the mill, loses its natural colour, and becomes of a cinnamon colour.

Demoiselle forte is less stamped, and of a dark brown colour.

Joseph Raisin, and *Quarré Muse*, are made of coarser nets and cords, which are not stamped fine. These two sorts are used for packing up the linen cloth at St. Quentin, Beauvois, and Troyes, because their dark brown colour sets off the whiteness of the cloth; and it seems that the manufacturers put some lamp-black in the engine, to darken the colour.

The Paper, called *Papier à Sacs*, is made of the coarsest rags, and is sold by weight; it is surprisingly brittle, and the manufacturers are therefore suspected of mixing it with something to encrease the weight, or it could not be so tender.

At the latter end of the last century the art of making Paper arrived to a great degree of perfection in England and Holland, so that the sale in France has not since been so extensive, and many Paper-mills have been shut up, or converted to other purposes. There were, a century ago, in the provinces of Perigord and Angoumois 400 Paper-mills, and now there are not one hundred remaining. But the exportation of Paper from France remains nevertheless very considerable; and it
still

still manufactures, after England and Germany, the largest quantity of Paper of any country in Europe. It exports very large quantities of all sorts, chiefly that manufactured for Paper-hangings, to the United Provinces of America, for which reason, on the 29th of December, 1787, the exportation-duty was not only taken off, but also the excise returned. At Montargis is the largest Paper-mill, erected to work with 30 vats, which would consume 1,620,000lb. of rags, and 135,000lb. of size, but want of water, and the quality thereof, has prevented its working to its full extent. At Vougeot, in Burgundy, is another large mill, with 12 engines and 20 vats, erected by Mr. Desventes, of which Mr. De Lalande has furnished the public with a complete description, and the drawings of all its parts and machineries.

In France are still upwards of 500 Paper-mills, which consume annually 20,000,000 weight of rags and coarse paper stuff. In Franche-Comte it was ascertained by the exchequer, that 16,000 cwt. of rags were collected within one year, of which 8,000 were manufactured in that county, and 8,000 exported to other counties: as Franche-Comte is only about $\frac{1}{16}$ part of France, 320,000 cwt. of rags must be annually collected in that country, and upwards of one-third, or 14,000,000 weight are still exported, notwithstanding the severe prohibition.

The time when linen Paper came into use in Italy remains likewise uncertain; and as all that has come to the knowledge

knowledge of the present time, cannot be satisfactorily proved, I will therefore quote only that which may be regarded as certain. The senate of Venice granted, in 1366, an exclusive privilege to the Paper-mill at Treviso, that no paper-shavings should be exported than for the use of that mill; if now shavings from linen Paper existed, it proves the manufacture of that Paper; a document of a notary, in 1367, proves likewise the use of linen Paper; Maffei states, that he is in possession of a family manuscript of linen Paper, written in 1367, and he attempts therefore to appropriate the invention of linen Paper to Italy. In 1374 the patent of the manufacture at Treviso, which proved successful, was renewed by the senate of Venice. An exclusive commerce in Paper was carried on at Venice, and the city of Gorlitz received, from 1376 to 1426, all her Paper from that country.

Angelus Roccha mentions a Paper manufacture at Foligni, in the 16th century; and he says, that at Fabriano was manufactured the best large Paper; and at Foligni, the best Paper of a small size. The Paper-mills at Fabriano are yet in esteem, and there are the greatest number in Italy. In the Pope's territory, at Tivoli, Viterbo, Ronciglione, Bracciano, and Rome, are many Paper-mills, but they do not make as much Paper as they might, from the quantity of rags gathered in that country; and Schlozer states, that one million in weight is annually exported to Genoa. The value is entered at 100,000 scudi, or crowns.

Venice exports large quantities of Paper to the Levant,* and to the Austrian dominions: at Colli, in Tuscany, is a mill which manufactures very good Paper. In the environs of Turin are several mills which furnish fine Paper; one Paper-maker in Venice is in possession of the secret of covering his Paper with a varnish, by which means the writings can be easily obliterated with a sponge, and he has found an extensive sale for this Paper. The Genoese had some time ago monopolized the Paper-trade of Italy, by manufacturing it of a superior quality and whiteness, and by using a particular size, which it is said prevented its destruction by moths; but this commerce is now greatly reduced.

* The commerce with Paper to Turkey is principally carried on by Venice: the assortments are white, thick, and very close; the Turks cannot make use of any weaker Paper, because they use a reed for writing, which is cut into the form of a pen. Those called *fioretto* and the *three moons* are in the greatest request, being very strong and very heavy. The *fioretto* is the most fashionable kind of Paper, and the dearest. The Turks gum it, and brighten it with a polishing-instrument.

Next to Venice, Genoa is the place in Italy which exports the greatest quantity of Paper to the Levant. The Genoese Papers are much lighter and not so dear as those of Venice: they are made use of in winter instead of window-glass, for economy.

Upon the whole, Italy sends Paper into Greece to the amount of 25,000*l.* and into Turkey to the amount of 250,000*l.* which ought to be noticed by our merchants and Paper-manufacturers, and engage them in a competition with the Italians in this important branch of the Levantine commerce, principally as Marseilles has been, since late years, the only place in France that can circulate any of its Papers in Turkey.

Germany

Germany disputes with Italy the most ancient knowledge of cotton and linen Paper. There were already in the 13th century cotton and linen manufactories established, which exported large quantities of goods to Italy and to the Levant; and it cannot therefore be surprising, if the art of inventing linen-rag Paper is judged to belong to Germany: but nothing has been proved. The several ancient manuscripts and pieces of linen Paper preserved in Germany do not positively ascertain that the first manufacture was established in that country; one piece of Paper, of 1308, which Mr. von Senkenberg sent, in 1763, to Mr. Meerman, only merits particular attention, it was strong, white, pliable, and had the marks of the wire-moulds, which are the tokens of linen Paper; it was nevertheless glazed, and much resembled parchment, which are tokens of cotton Paper. The Royal Society of Sciences at Gottingen judged therefore, if the date could be taken as certain, that the epocha could be taken for the true time when linen Paper was invented, notwithstanding Professor Murray believes it to be mixed Paper, of linen and cotton, manufactured at Fabriano. If it should be linen Paper manufactured in Germany, it must have been, according to their opinion, on the frontiers of Italy.

The water-mark of a bull's head in the Paper, which scientific men take as an undeniable token of books printed in the first printing-office of Faust, is only the first water-mark made in the most ancient German linen Paper, and is found in all ancient German manuscripts, and the first printed books, with some alterations: the first manufactured Paper of Germany is of the
year

year 1312, with the water-mark of a plain bull's head, which may have been adopted likewise by Paper-makers of other countries, and is still in practice with many sorts of Paper that are in great demand; for example, the words *Pro Patria*, which are water-marks in Paper like our foolscap, originated in Holland, but it is likewise made use of in French and German mills; and if the sign of a bull's or bullock's head, which are the arms of Mecklenburgh, is to be taken as a proof that the first Paper was made in that country which uses these arms, then is Mecklenburgh entitled to the honour of this discovery.

It seems, by the numerous relics of ancient linen-paper in Germany, that it there came into use at the beginning of the 14th century, and Ulman Stromer of Nuremberg, who died in 1407, began in 1360 to write the first work on the art of Paper-making, and he established a large Paper-mill in 1390. He employed a great number of persons, amongst whom were three Italians, Franciscus, Marcus de Marchia, and Bartholomæus; all of them were obliged to make oath not to instruct any person in the art of Paper-making, or to make Paper for their own account, except another of the name of George Thirman, who bound himself only for ten years. In the first year he employed two rollers, which set eighteen stampers in motion, but when he would in the second year add another roller, he was opposed by the Italians whom he employed, who would not consent to the enlarging of his manufacture; but they were imprisoned by the magistrates, and then they submitted by renewing their oaths.

All the Paper-mills erected, since the art of printing has been invented by Koster, of Haarlem, in 1430, cannot be brought forward as a testimony to prove the invention of linen Paper-making in Germany; but, after the noble invention of printing (by which ideas can be so easily conveyed and dispersed) came in practice, the rapid extending and the multiplying of printing made the increase of Paper-mills necessary. In the environs of the Rhine, in Suabia, Franconia, Alsatia, Misnia, and Bohemia, are the greatest number of Paper-mills. In the Hanoverian dominions are thirty-four, and Beyer states that there are in Germany five hundred Paper-mills* (those in

* I subjoin here an account of some Paper-mills in Germany, as far as I could obtain knowledge thereof.

		Brought over	143
1. In the Circle of Upper-Saxony,		Catzenellenbogen	2
in the Chur-Mark	4	Hanau-Münzenberg	1
Chur-Saxony	80	5. In the Circle of Franconia, in the	
Swedish-Pomerania	2	County of Henneberg	3
2. In the Circle of Lower Saxony,		6. In the Circle of Suabia, near	
in the Hanoverian Dominions	34	Augsburg	4
Mecklenburgh	6	Ulm	1
Near Hamburg	2	7. In the Circle of Bavaria, near	
3. In the Circle of Westphalia, in		Regensburg	1
the Principality of Minden .	1	8. In Bohemia	81
County of Lippe	6	9. In Silesia, in the Environs of	
Abbey of Werden	3	Hirschberg	4
County of Tecklenburg and Lin-		Sagan	2
den	3	Wartenberg	2
4. In the Circle of the Upper Rhine,		Schweidnitz	12
in the County of Isenburg .	2		
	143	Which amount to	256

It

in Austria and Prussia not included), which manufacture at least 2,400,000 reams of Paper. According to Count Ewald von Hertzberg, there were, in 1785, in the Prussian dominions, eight hundred Paper-manufactures, the revenue thereof produced 200,000 dollars annually.

Large sums of money go notwithstanding from Germany to foreign countries, for the purchase of Paper, because the Paper-makers make in general coarse Paper chiefly for printing, and the finer sorts and writing-paper are imported. In the port of Hamburgh were imported, in 1782, 7,439 bales (of 10 reams and upwards), 4,336 reams, four casks, and three chests, with Paper. That city has no more than two Paper-mills, of two vats each, which consume 6,000 cwt. of rags. The annual increase of printing presses, and the want of rags and Paper-stuff, has engaged the Paper-makers to make many more reams of paper from one cwt. of rags than formerly, which renders the present German printing-paper very disagreeable to the printers and readers.

It is therefore apparent that there must be more than 500 Paper-mills in Germany.

Large quantities of Paper-materials are lost in Germany, because the coffins in which they lay the deceased are filled in the most part of Germany with Paper-shavings; the bodies are likewise clothed with a linen shift or shirt, and are laid on a linen sheet.

Confiscated books are burnt in Germany.

There

There are in the kingdom of Sweden no more than 24 Paper-mills. In Stockholm alone were imported, in 1781, 18,579 reams of Paper: 8,142 reams for writing, 5,786 reams for printing, and 4,651 reams of packing-paper, and coarser sorts.

When the Czar, *Peter Alexiewitz*, visited Dresden, in the year 1712, he saw the Paper-mill belonging to Mr. Schuchart, and made a few sheets of Paper with his own hands; he was so pleased with an art which gives surprise to every person who visits a Paper-mill for the first time, that he engaged immediately Paper-makers, whom he sent to Moscow, to establish Paper-mills at his own expence; and Mr. Pfeiffer, a German, erected, with the assistance of a carpenter from Commothau, a very fine Paper-manufactory; to which the said Emperor granted great privileges. At Jaroslaw is now a Paper-mill, with 28 engines and 70 vats, which manufactures weekly 1,100 reams of Paper, and consumes annually 800 tons of rags; and another which works 13 vats by 13 engines: they make principally Paper for Paper-hanging, which they sell at Moscow. There are 23 Paper-mills in the Russian empire, and, notwithstanding, they are not in want of rags (the exportation of which is prohibited), they import annually Paper to the amount of 220,000 rubles.*

In

* The duty to be paid on imported Paper is as follows: for writing-paper, from 2 to 5 rubles per ream; coloured Paper from 2 to 4 rubles; blotting-paper, 3 rubles; all Paper used for making cards, 3 rubles; royal, 1 ruble, 60 copecs,

In the government of Kaluga are several Paper-mills; and, according to Wafilii Szujew, all offal by the preparing and weaving of hemp and flax, with the spoiled yarn in the linen and sail-cloth manufactories, are delivered to the Paper-mills.

In the commencement of the present century there were very few Paper-mills in Holland, and the Dutch imported great quantities of Paper still in 1723 from St. Malo, Nantz, Rochelle, and Bordeaux; but, since that time, they have erected numerous mills, and carried on an extensive commerce, which has suffered greatly since that country has been governed by the French Republic. In the province of Holland were, in 1770, eleven large and considerable Paper-mills. In Gelderland are a great many, but some so small that they are only able to make four hundred reams of Paper annually: and there are also water-mills with stampers, like those in Germany. But in the province of Holland there are wind-mills, with cutting and grinding engines, which do more in two hours than the others in twelve. In Saardam, a thousand persons are employed in Paper-making. Holland produces not one-tenth of the quantity of rags used in that country for Paper-manufacturing, which are smuggled in from France, and imported from Germany, Italy, and Portugal; the latter of which are of the coarsest kind. The Dutch are chiefly jealous with respect

to 2 rubles; ploughed letter-paper, in quarto, 1 ruble, 35 copecs; and if with gilt edges, 1 ruble, 80 copecs; printing-paper 75 copecs; pasteboards for the use of manufactures, 60 copecs for a hundred.

to this manufacture, and the exportation of moulds is prohibited under pain of death. They export large quantities of Paper principally to Hamburgh. From twenty to thirty thousand reams are annually exported to Sweden; and the exportation to France, England, Denmark, and Russia, is not inconsiderable, because they manufacture some sorts superior to those manufactured in other countries.

I conclude by observing, that they manufacture principally writing-paper, and Paper, of a violet colour, for packing sugar-loaves. For their own printing-presses, they purchase Paper from France and Germany.

According to all researches, we are obliged to Mr. Meerman's indefatigable perseverance, for knowing that in 1308 linen-paper was used: the discovery of this invention may have been made some years sooner, but the precise period cannot be positive ascertained; nor in what country this invention originated.

In Italy has been preserved linen-paper, of 1367, and in Spain, of the same year; in England, of 1342; in France, of 1314; and in Germany, of 1308; it is, therefore likely, that Germany has the honour of its invention.

Ducarell states in his letter to Mr. Meerman, that, in England, many documents from the year 1282 to 1347 are preserved; but he acknowledges that it is impossible to ascertain, whether these manuscripts are written on Paper made from

from linen, without any mixture of cotton. Prideaux quotes a register of acts from John Cranden, of the fourteenth year of the reign of Queen Elizabeth, written on linen-paper in 1320; but it has been determined, that in many instances, he had not a competent judgement to ascertain the true quality. Mr. Aftle, who wanted neither knowledge, nor the opportunity of making more effectual inquiries, is silent as to the time when the linen-paper came into use in England; all that he merely remarks is a repetition of what Prideaux has stated. There is in the library at Canterbury, according to the Philosophical Transactions of the year 1703 (No. 288, page 515), an inventory written on linen-paper, specifying the inheritance of Henry, who was prior of Christ-Church, and died in 1340. Dr. Wendeborn states, that, in the British Museum, there are pieces of linen-paper from the Cottonian library, written in the reign of Edward III. in 1342; and he believes that if the manuscripts which it possesses were carefully examined, there might be found others of a more ancient date.

As nothing farther has yet been ascertained, or come to public knowledge, we must take these manuscripts of 1342 for the oldest proof of the period when linen-paper came into use in England.

The art of manufacturing Paper from linen and linen-rags was only established in England in the latter part of the 16th century. All Paper used before that time was imported from Holland and France, and she paid, so lately as the year 1663, one hundred thousand pounds to the latter country,

country, for imported Paper. A German, of the name of *Spielman*, had the happiness, under the reign of Queen Elizabeth in 1588, to erect at Dartford, in Kent, the first Paper-mill; for which he received from her Majesty the honour of Knighthood.

It is recorded in the *Craftsman*, No. 910, that King William III. granted the Huguenots from France, refuge in England, (*Biscoc* and others) a patent for establishing Paper-manufactories; and parliament granted to them other privileges: but, from a want of unrelaxed perseverance, economy, and industry, their undertaking met with the same fate that often attends new establishments: it went to ruin, notwithstanding its success in the first few years; and the manufacture of Paper in general decayed, until the year 1713, when Thomas Watkin, a stationer, in London, brought it in a short time into great repute and perfection; and it is a merit attributable to him, that the preservation of this important, most useful, and necessary of all arts has given rise to the establishment of the numerous Paper-mills that England now possesses, which manufacture very large quantities of Paper of all sorts in the greatest perfection: not only a great part of which is exported to foreign countries, but the importation of this commodity is now confined to a few assortments only, of which there cannot be a doubt, that these kinds of Paper yet imported, will soon be manufactured in this country of an equal quality, because, by perseverance, convenience in the construction of these manufactures, superior engines, presses and machines, and improved moulds, the industrious manufacturers have

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been

been assisted and enabled to give English Paper its actual pre-eminence.

Ireland has, during many years, offered and paid premiums to encourage those concerned in Paper-making, for the manufacture of the best and the largest quantities of Paper; but notwithstanding such incitement, and that provisions and labour are there cheaper than in England, it is under the necessity of importing considerable quantities from hence, and paying a higher price than for their home-manufactured Paper.

Scotland manufactures good printing-paper, which greatly surpasses that of the Germans, in whiteness and strength.—Messrs. Foulis, printers, at Glasgow, are said to export annually on an average two millions of copies of books to foreign countries, and it must be presumed that they are partly indebted to the superiority of the Scotch Paper, over that of Germany and the Northern countries, for the pre-eminence to which their printing-house has been raised.

England, which does not furnish such considerable quantities of rags as might have been expected from the number of its inhabitants, and their superior cleanliness in linen, notwithstanding, consumes at present in its extensive and numerous Paper-mills, more rags than any other country in Europe. The revenue arising from the excise-duty on Paper amounted, in the year before the last, to 140,000*l*. If we now calculate that six-fifteenth parts of the whole quantity of Paper made in England is writing and printing Paper, which pays 2½*d*.

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per pound excise-duty; that five-fifteenths are of the second class of paper, paying one penny per pound; and that, of the remaining four-fifteenth parts, one-half pays a halfpenny per pound, and the other half nothing; we find that twenty-four million pounds weight of rags and other paper-stuff is annually manufactured into Paper.*

One reason that may be assigned is, that they are not so carefully gathered as in other countries; but another and more powerful one is, that the greatest part of the English families are able to live more comfortably than the people of other countries, and think the saving of rags not worth their notice, or think them of so trifling a value, that a great part is burnt or destroyed. But, as I have before stated, that the British nation is in part indebted for their wealth, and pre-eminence above all other nations, to the manufacture of Paper, and the art of printing, writing, and drawing; and as it is certain, that the quantity of Paper manufactured in England is the next to that of wool, cotton, and linen, and employs not only many thousands of hands in the mills, but gives bread to stationers, authors, printers, booksellers, and bookbinders, which are so numerous with their dependents, that it may be taken for granted, that this manufacture gives livelihood to a greater number of persons than any other; every head of a family should therefore consider this branch of commerce and revenue as a national concern, and follow the example of the Dutch families, who lay by all old rags, clean washed,

* The importation of rags from the continent, in 1799, was 6,307,117 *lb.*

and sell them afforded annually to the agents of the Paper-mills: and there can be no doubt but the saving of rags and waste Paper in England would equally contribute to the advantage of this valuable manufacture.

By the act of parliament, which prohibits, under a penalty, the burial of the dead in any other dress than wool, may be saved about 250,000 pounds weight of linen * annually; which in other countries perish in the grave: but this is of little consequence relative to the great consumption of rags, and does not form more than a one hundredth part.

The want of this article obliges us therefore to import the required quantity for our mills from abroad, until other substitutes can be converted to answer the purpose of rags: till those are brought to perfection and generally adopted: and until the Paper manufactured thereof is universally protected, by every well-wisher to his country. The value of the Paper manufactured in 1784 in England has been stated to amount to 800,000*l*. and it will not be over-rated if we give the present annual value, by reason of the increase of the use of Paper and of its price, at one million and a half sterling; which, after it has gone through the hands of the stationers, and is finished by the authors, artists, engravers, printers, and bookbinders, and put up for sale by the book

* Calculating that out of thirty persons living, on the average, one dies annually, and that one pound weight of linen might be used at every burial, and the number of inhabitants seven millions and a half.

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and print sellers and stationers receives such additional value, that its amount may be estimated at some millions more.

Parliament has therefore, for the support of this manufacture enacted, that rags, old nets, and ropes (which are used for manufacturing pasteboards, wrappers, and packing-paper), can be imported duty free ; and last session, it likewise allowed the free importation of all waste-paper, provided it is torn into pieces so that it cannot be used otherwise than for being re-manufactured. These measures will in some degree assist the Manufacture recently established for that purpose; but notwithstanding, cannot sufficiently obviate the lamentable scarcity, and greatly reduce the price of rags and other paper-stuff: the consumption of the Paper manufactured of the latter materials (old nets and ropes) has likewise increased very much, and must be the more considerable as the commerce of this country is extended.

These circumstances, and the establishment of the *Regenerating-Paper-Manufacture*,* brought to my recollection what Bruyset, Levier de Lisle, Fonde, Gleditch, Greaves, Guetard, Klaproth, Linne, Clarus Mayer, Reamur, Schäffer, Seba, Stakel, Strange, and other scientific men had noticed, and their ideas on substitutes for paper-materials. These authors have stated, that as cotton, flax, and hemp, are the origin of paper

* The remanufacturing of Paper has been long practised by the Chinese ; and there is, in one of the suburbs of Pekin, a considerable paper-manufacture for that purpose, which gives employ to numerous persons who collect waste-paper, which is purchased at a low price.

and rags, other vegetables of a tender and pliable nature might probably be converted into a mucilaginous pulp, and adopted in the manufacture of Paper; and farther, that those vegetables that are of a brittle and harsh nature, but which can be obtained in large quantities and at moderate prices, might by art and perseverance be made tender, without destroying that quality which is necessary to be retained in paper-stuff. It is a grand *desideratum*, that these suggestions should be brought into effect; and it is surprizing that the observations of the authors above quoted should not have been earlier attended to by scientific men, or rather by intelligent paper-makers, who had the road thus opened to them for their investigation: for, should any man have discovered a commodity, which could be cheaply and plentifully supplied in this country, as a substitute for rags, &c. to mould unexceptionable Paper, such a man would amply merit the approbation and encouragement of the public.

Dr. Schäffer, it is true, worked with perseverance, industry, and ardour, to prove that numerous vegetables were qualified to make Paper, and his fame will be immortalized; but, notwithstanding that this author theorized on the subject with great ability, he accomplished nothing satisfactory by his experiments, which only tended to prove that various vegetables could probably be so molified as to make useful Paper with the addition of a small quantity of rags: neither himself, nor any person who has followed him, has ever been able to make it at all without rags, or fit for printing, writing, paper-hanging, and other purposes.

Travellers affirm that the Chinese and Japanese use a lye in their paper-manufactories, by which they convert plants, the bark of trees, and several other vegetables, into a pulp,* which is afterwards moulded into a large and beautiful Paper: this Paper, however, notwithstanding its apparent smoothness, is very liable to break. No author has satisfactorily described the ingredients that are used in making this lye, or the farther process that vegetables must undergo, before they are sufficiently macerated and reduced to a state to be formed into Paper: and all farther information has been cautiously concealed from us.

In addition to the high price to which Paper has already advanced, the accounts that have been received from various parts of the continent shew that the price of rags will augment rather than abate. Considerations of this kind induced me to make farther trials, and endeavour to accomplish that which had been thought impossible by others, and which had baffled the attempts of many ingenious men. My perseverance and labours have been crowned with success.

I have now had the satisfaction of witnessing the manufacture of several thousand reams of perfectly clean and white Paper, since the 1st of May, made from old waste, written, and printed Paper.† Succeeding thus far in the attempt,

* All Paper made in the province of Che-Kyang is manufactured from the straw of rice and other grains.

† Under the inspection of the truly ingenious Mr. Carpenter.

I profess to have farther views, in assiduously endeavouring to manufacture the most perfect Paper from straw and other vegetables ; which, if successful, will render this commodity more useful than for the purposes it has been hitherto applied, and more interesting of course to the landed property of this kingdom, and to the public at large. I have in a great measure accomplished this undertaking : for, although I cannot yet boast of having manufactured the most perfect straw-paper, these lines are printed upon it, to demonstrate the infant progress of so singular an undertaking, and to prove its possibility, notwithstanding the opinion of many scientific men, particularly that of the ingenious Breitkopf, that Paper made from straw cannot be used for printing. This specimen leaves no doubt in my mind, that, when the manufactory has been regularly established with the necessary implements, I shall make straw-paper in as great perfection as that which is now re-manufactured from waste-paper ; but I have thought it adviseable, imperfect as this sample may appear, to lay it at the feet of MY SOVEREIGN, in order to prove as speedily as possible, to the public at large, the progress I have made in the prosecution of my design ; and thereby to prevent fallacious reports, and erroneous impressions being made on their minds, as well as to remove the prejudices which are generally cherished against new discoveries.

I flatter myself that these exertions will meet with the approbation and support of the community at large, as the discovery will prove of great national benefit : it will increase the revenue ; it will employ numerous hands of both sexes and of
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all ages ; it will prevent the necessity of so much money being sent to the continent, for the purchase of rags ; * it will increase the value of land ; and it will ultimately reduce the price of Paper. And if the manufacture of Paper from straw alone should be only serviceable for pasteboards, packing-paper, and paper-hangings,† it is hoped and believed that this country will thereby be enabled to provide the latter article to the *whole world, at a lower rate than it is possible to manufacture it from rags*. But whether or not this country can avail itself of all the advantages that are likely to result from a discovery which promises to become so generally useful, as the manufacture of good Paper from *Straw*, will, in my humble opinion, intirely depend on such measures as the legislature of this country shall in their wisdom think it prudent to adopt, in order to prevent the discovery from being known to other countries :— a measure perhaps not undeserving the attention of the British Government, at this conjuncture, when the splendour of its

* If from 5,000 to 6,000 loads of straw will be converted annually into Paper, used for paper-hangings, it will be equal to the quantity of rags imported from the continent in 1799. Those rags are principally used for that kind of Paper (elephant); they being of a stronger texture than English rags. By this means, the money which is now sent to the continent, for that article, would be saved. And as paper-hangings made from straw-paper may be manufactured much cheaper, to the taste of the people abroad, than they can make it from rags, it will increase the employ of hands, and lead them to send their money to this country for the purchase of it.

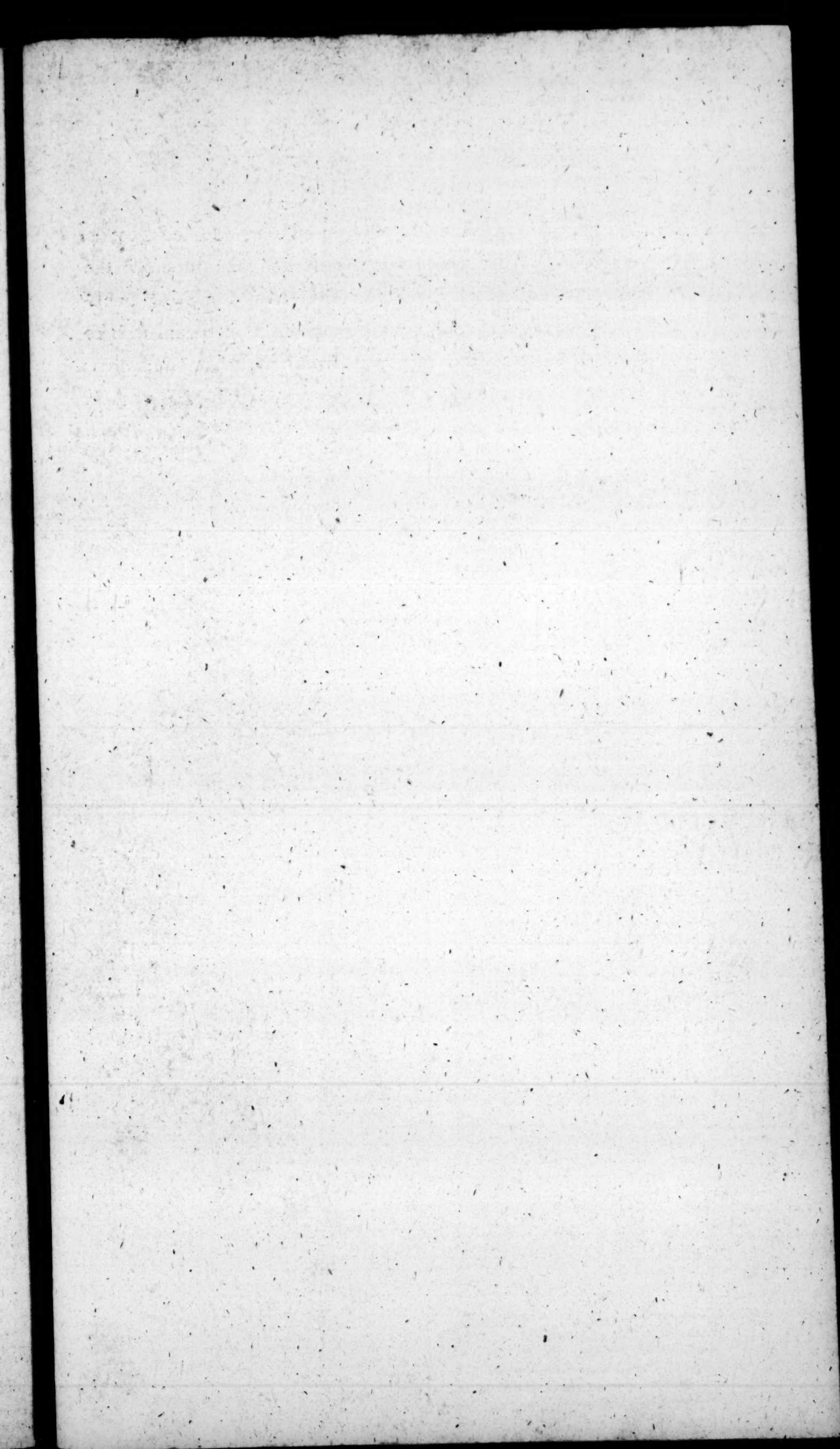
† Of its general usefulness, for the purpose of paper-hanging, Mr. Duppa, a gentleman of eminence, ingenuity, and superior taste in that science, has no doubt.

manufactures and commerce is more envied than at any former period of our history.

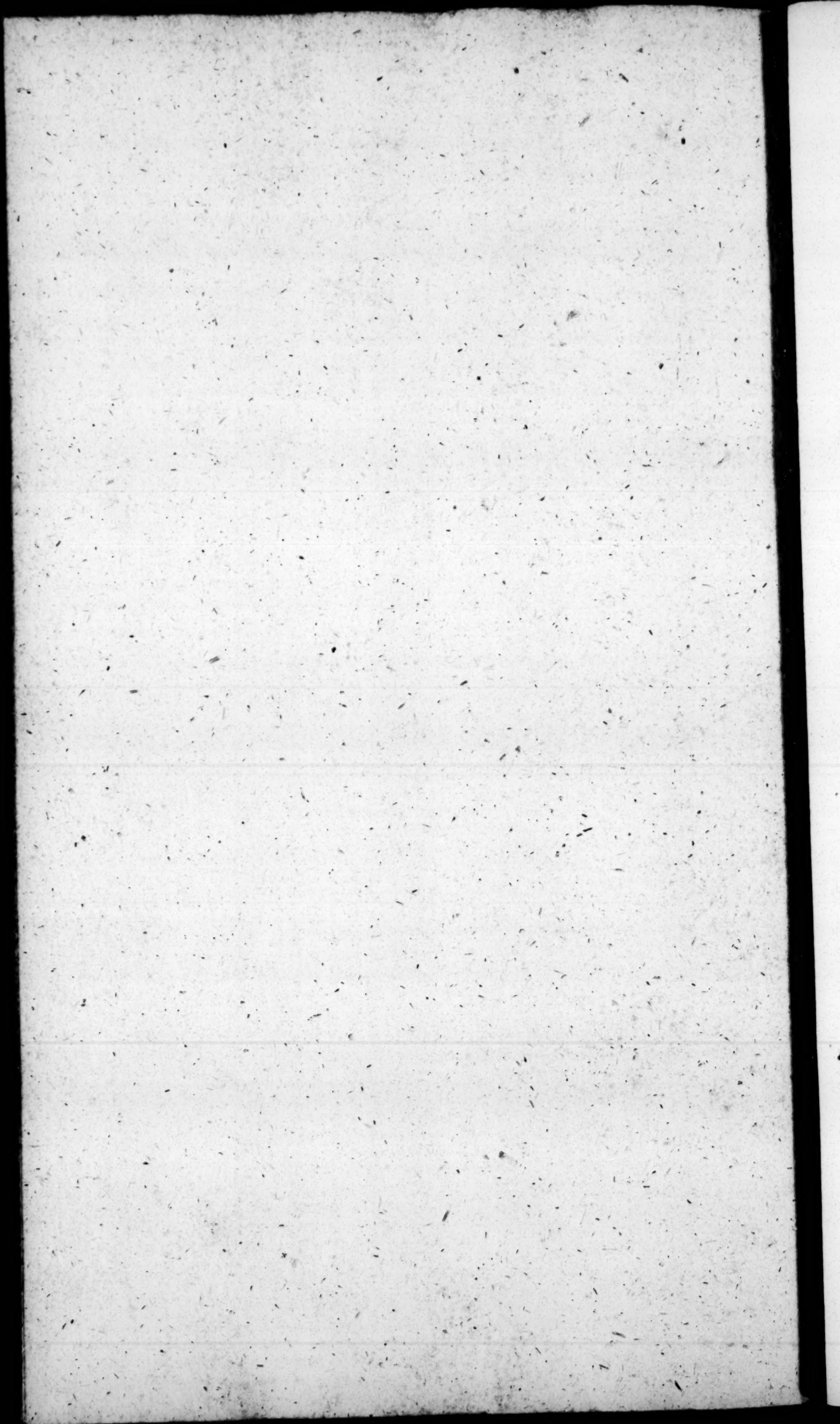
I therefore flatter myself that I shall experience protection and support from the powers of Government, and through them overcome all prejudices against this newly invented *Straw-paper*; not doubting that I shall, by my unremitting perseverance, bring the discovery to the greatest perfection, and that my efforts will render it eligible for general use: then the opinions and judgements, which are inconsiderately or enviously circulated to the injury of every new establishment, will be turned to its advantage, and will inevitably promote the reduction of the high price of Paper.

And it would be productive of the greatest satisfaction, if, by farther experiments and researches, I can accomplish the object I have in view, namely, that of manufacturing Paper from vegetables, for the purpose of making bank-notes, which I flatter myself I shall be able to effect. A discovery of such description must be a source of great and pleasant reflection to every philanthropic mind, since the opportunities of forgery on the Bank of England, which at present exist, will be immediately done away, and the public mind relieved from hearing of such crimes, and of the executions which ensue from the conviction of the offenders. That such will be the good consequences resulting to the community, from manufacturing Paper of the said materials for the before-mentioned purpose, must be manifest, because the mixture of vegetables from which the Paper would be made might remain a secret,

if the necessary measures for that purpose are adopted: consequently no forgery could henceforth be committed on the Bank, as long as such Paper should be used in making bank-notes, because the counterfeiting of the Paper cannot take place, as long as the materials from which it is made is unknown, and as long as the Patent granted by *His Majesty* is in force.



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A P P E N D I X.

AS an Appendix to this little Tract, I think it proper to submit a few more remarks on the National Importance of discovering materials which can be converted into Paper, and grow sufficiently abundant in Great Britain, without the necessity of importing them from foreign countries.

The following lines are printed upon Paper made from Wood alone, the produce of this country, without any intermixture of rags, waste paper, bark, straw, or any other vegetable substance, from which Paper might be, or has hitherto been manufactured; and of this the most ample testimony can be given, if necessary.

Having thus far succeeded in my researches, to make an useful Paper from one kind of Wood, I

doubt not, but, that I shall find many others equally eligible for the same purpose, of which I trust it will be in my power, within a few weeks, to give indisputable proof that my expectations have been well founded, and that I have not cherished a visionary opinion.

History furnishes us with numerous examples of one discovery giving birth to others, and, if my success of having encreased the quantity of Paper materials, by rendering these applicable to that which have never been before applied to such a purpose, should incite active and industrious artists, to make farther improvements in their various manufactures, my feelings will be amply gratified. Various hints may be suggested to those who are already acquainted with the properties of Paper, when pasted in lamina on each other; it may, by this means, be made to form a substance, as durable and more impenetrable than oak.

Having long admired the celebrated manufacture of Mr. *Clay*, at Birmingham, who has demonstrated to what perfection and beauty it has been brought, it will, in the course of time, perhaps not be surprising to find, that objects of greater consequence will engage their attention in the same pursuit, and
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prove, that the properties from successive layers of Paper, may be found a substitute for many purpose, for which at present foreign Wood is required.

One of the greatest obstacles to the improvement and extension of this art has been probably the scarcity of the raw materials. Now that these are found *at home* in sufficient abundance, means may be found to supply manufactures with any quantity required, at reduced prices.

It may probably be ultimately proved, that Paper thus prepared, will be a lighter, neater, and more durable covering for buildings of all kinds, and it is equally true, that the ingredients, with which the cement can be composed, will render this substance not only incombustible, but more durable than slates, tiles, (which in the course of time become brittle) and wood in its natural state, and incorruptible by insects. Who can say that coach-makers, chair-makers, and cabinet-makers, will not make use of it for carriages, chairs, and elegant household furniture, and reflect that a substance possessing such superior properties ought to be preferred; having flexibility, hardness, and capability of being worked with infinite greater neatness and lustre than wood, which is so much affected by the air and weather.

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Converting wood and straw into Paper, may therefore be rendered useful for a variety of purposes ; and the substance of the Wood Paper on which these lines are printed, (which is the first attempt to make it in a quantity) exhibits an indisputable proof, that useful Paper may be manufactured from the hardest part of wood alone, destitute of its pith or bark ; and, if any of the suggestions here stated, as to the application of the manufactured material should be thought reasonable, experiments of some able manufacturers will prove, that this Paper can be again converted into a substance, more hard and durable than any wood of natural growth.

Considering, in its full extent, the numerous uses to which the discovery of making Paper from wood and straw, which always can be obtained in this country at moderate prices, can be applied, it is certainly an invention that merits attention and support. If only fit for the manufacture of inferior sorts of Paper, and Paper-hangings, this country will be enabled to cope with the whole world in this species of commerce, on the most advantageous terms, and to enrich herself, by opening this new source of trade, very lucrative to the revenue, and allowing the manufactured commodity to be sold for less than the present price of Paper ; whilst, at the same time,

it will make several materials* more valuable, and, by giving employment to thousands of women and children, thereby establish an influx of real wealth into this country.

The wisdom of the legislature has rendered it necessary that the specification of every patent should be made public within the space of twenty-eight days, which has been sometimes extended to six months. The patentee's benefit exists for fourteen years, and is extremely well protected by the law against the infringement of its privileges, by the inhabitants of Great Britain; but it appears very extraordinary, that every patent is open for the inspection of foreigners, and that the patentee remains unprotected with respect to them. A pamphlet has been suffered to be published monthly, since the year 1794, which describes not only the existing patents of the country, but contains complete drawings and descriptions of new-invented machines. This pamphlet has been, and will be, immediately translated into the continental languages; a practice which has, no doubt, proved highly detrimental to the revenue and commercial interest of this country.

* Saw-duft and wood-shavings.

If a patent is obtained for an ingenious invention, which may have cost the author many years intense labour and study, and the result produces great national wealth by the manufacture and exportation of the commodity, the prospects may be clouded in an hour, and all expectation baffled, by foreigners reading the specification, who, by erecting similar manufactories abroad, under greater advantages, deprive the country of the revenue and commerce. If this subject was duly weighed, it surely might be remedied. It may be asked, why a patent is to be openly exemplified before its term is expired? for, as it can be of no use to the inhabitants of this country, during the space of fourteen years, for what purpose is it exposed? and why are foreigners permitted to reap the benefits to which this country is only entitled? It is undeniable, that it operates as a perpetual discouragement to the future efforts of genius, preventing monied men carrying the most valuable discoveries into effect. The doubtfulness of success alone sufficiently damps the ardour, perseverance, and exertions necessarily required in the pursuit of skilful and laborious inquiries; but, having succeeded to his utmost wishes, and after having incurred very injurious expences in the prosecution of his design, he is foiled in all his hopes of compensation, by the

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exposure of the means through which the discovery has been effected. This consideration alone ought to weigh with those by whom this evil can be remedied to the individual. But, much as it may be lamented, this injury bears no proportion to the losses which the revenue and commerce suffer.

It therefore appears impolitic in the last degree to expose the exemplification of a patent to public disclosure, and to be a *desideratum* of such infinite importance, that the Legislature may think of some method to prevent the art from being divulged in a patent, and being purloined by foreigners, who are jealous of the greatness of the manufactures, commerce, and navigation, of Great Britain.





